State of Rhode Island
Coastal Resources Management Council
Oliver H. Stedman Government Center
4808 Tower Hill Road, Suite 3
Wakefield, RI 02879-1900

(401) 783-3370
Fax (401) 783-2069

APPLICATION FOR A FRESHWATER WETLANDS DETERMINATION OR PERMIT

PART A - APPLICATION TYPE:

- ☐ Request to Determine the Presence of Jurisdictional Area [650-RICR-20-00-9.9.2]
- ☑ Request to Verify Wetland Edges [650-RICR-20-00-9.9.3]
- ☑ New Freshwater Wetlands Permit [650-RICR-20-00-9.11]
  - ☐ with Variance
- ☐ Application for Significant Alteration [650-RICR-20-00-9.12]
- ☐ Permit Modification [650-RICR-20-00-9.14.3] - Existing Permit #:

File No. (CRMC USE ONLY)
2023-10-104

Application Fee:

PART B - APPLICANT INFORMATION AND CERTIFICATION (Note: The applicant must be the owner of the property or easement which is the subject of this application or must be the government agency or entity with power of condemnation over such property or easement):

Name of Applicant: Algonquin Gas Transmission, LLC

Name and Title of Representative (if Applicant is an Organization): Joe McGaver, Manager Environment Projects

Applicant's Mailing Address: 11 East Superior Street, Suite 125
Street Number and Name or P.O. Box

Duluth | MN | 55802
City/Town | State | Zip Code

Applicant's Email Address: Joe.McGaver@enbridge.com

Applicant's Phone Number: 218-390-9254

STATEMENT OF DISCLOSURE AND APPLICANT AGREEMENT AS TO FEES:

The fees which must be submitted to the Coastal Resources Management Council are based upon representations made to the Coastal Resources Management Council by the applicant. If after submission of this fee the Coastal Resources Management Council determines that an error has been made either in the applicant's submission or in determining the fee to be paid, the applicant understands that additional fees may be assessed by the Coastal Resources Management Council. These fees must be paid prior to the issuance of any assent by the Coastal Resources Management Council. The applicant understands the above conditions and agrees to comply with them. The applicant acknowledges by evidence of their signature that they have reviewed the Rhode Island Coastal Resources Management Program, and have, where possible, adhered to the policies and standards of the program. Where variances or special exceptions are requested by the applicant, the applicant will be prepared to meet and present testimony on the criteria and burdens of proof for each of these relief provisions. The applicant also acknowledges by evidence of their signature that to the best of their knowledge the information contained in the application is true and valid. If the information provided to the CRMC for this review is inaccurate or did not reveal all necessary information or data, then the permit granted under this application may be found to be null and void. Applicant requires that as a condition to the granting of this assent, members of the CRMC or its staff shall have access to the applicant's property to make on-site inspections to insure compliance with the assent. This application is made under oath and subject to the penalties of perjury.

Joe McGaver — 10/17/2023

Applicant's Signature — **Date (mm/dd/yyyy)**

If more than one property owner is applying, please use the Supplemental Document: Additional Applicant Information and Certification

PART C - PROPERTY LOCATION SUBJECT TO THIS APPLICATION:

Primary City/Town: Portsmouth and Little Compton

Street Abutting Site, with Address (if applicable): Various, see included narrative and attachments

Nearest Intersecting Street: West Main Road, Old Mill Lane, Swan Drive

Distance (in feet) and Direction to Property from nearest street intersection: n/a

Tax Assessor's Plat(s) and Lot Number(s): See Attachment B, enclosed.

Closest Utility Pole Number: n/a

Has a Freshwater Wetlands application been previously submitted for this property? ☑ No ☐ Yes
If yes, Previous Permit Application #

Have there been previous enforcement actions for this property? ☑ No ☐ Yes
If yes, Previous Enforcement Action File #

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/ajt

PART D - PROJECT INFORMATION (Note: The Interactive GIS Map can provide helpful information for answering some of the below questions)

Within which river buffer zone region is the site located? □ Urban Region □ Region 1 □ Region 2

Will the project alter Freshwater Wetlands?	☐ No	☑ Yes	If yes, sq. ft. 88,862 temporary impacts
Will the project alter Watercourse?	☐ No	☑ Yes	If yes, sq. ft. 650 temporary impacts
Is the project located within a Drinking Water Supply Reservoir Watershed (DWSRW)?	☑ No	☐ Yes	If yes, sq. ft.
Is the project located within a Natural Heritage Area?	☐ No	☑ Yes	
Have rare wetland types or rare species been documented?	☑ No	☐ Yes	
Does the project propose any of the following:			
New or increased impervious cover for property other than a single-family home?	☐ No	☑ Yes	
Disturbance of more than 10,000 sq. ft. of existing impervious cover?	☑ No	☐ Yes	
Fill in any amount of floodplain or alter storm flowage to a river, stream, or wetland on any lot?	☑ No	☐ Yes	
*If yes to any, please contact **RIDEM Office of Water Resources** for additional guidance.*			
Does this project require a variance from the Freshwater Wetlands Standards?	☑ No	☐ Yes	
Has a variance from local zoning setbacks been sought?	☑ No	☐ Yes	
Is municipal master plan approval required for this property?	☑ No	☐ Yes	
If yes, attach a copy of municipal master plan approval to this application form.			

PART E - SITE WORK AFFIDAVIT

- Wetland flags are present on site and are correctly and legibly labeled
- The wetland flag numbers on site correspond to those depicted on the plans
- The wetland flags have been accurately surveyed and depicted on the plans
- The proposed Limit of Disturbance (LOD) and other proposed activities and features have been staked and labeled on site (see § 9.8.6).

I have inspected the subject property and its surroundings and do hereby attest that to the best of my knowledge, all site work performed above has been accurately completed and certified at the time of application submission and prior to CRMC inspection, in accordance with the Rules and Regulations Governing the Protection and Management of Freshwater Wetlands in the Vicinity of the Coast (650-RICR-20-00-9).

PART F - PROFESSIONAL CERTIFICATION

I hereby certify that I have been authorized by the applicant to prepare documentation to be submitted in support of this Application; that such documentation is in accordance with the Rules and Regulations Governing the Protection and Management of Freshwater Wetlands in the Vicinity of the Coast (650-RICR-20-00-9); and that such documentation is true, accurate, and complete to the best of my knowledge.

Note: The Project Manager / Primary Professional should enter their information first.

Name and Title: Kate Wheeler SWCA Associate Project Manager d/b/a:
Email Address: katelyn.wheeler@swca.com Phone Number: 207 509 4386
Signature: Date:
☐ By checking this box, I attest that I have reviewed and certify the Site Work Affidavit in Part E. I last inspected the property on:

Name and Title: d/b/a:
Email Address: Phone Number:
Signature: Date:
☐ By checking this box, I attest that I have reviewed and certify the Site Work Affidavit in Part E. I last inspected the property on:

Name and Title: d/b/a:
Email Address: Phone Number:
Signature: Date:
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/ajt - 07-2022

Rhode Island Coastal Resources Management Council Freshwater Wetlands in the Vicinity of the Coast Permit Application

Algonquin Gas Transmission, LLC
G-2 Natural Gas Pipeline Maintenance Project

OCTOBER 2023

Prepared For
Algonquin Gas Transmission, LLC

Prepared By
SWCA Environmental Consultants

RHODE ISLAND COASTAL RESOURCES MANAGEMENT COUNCIL
FRESHWATER WETLANDS IN THE VICINITY OF THE COAST PERMIT APPLICATION

ALGONQUIN GAS TRANSMISSION, LLC

G-2 NATURAL GAS PIPELINE MAINTENANCE PROJECT

Prepared for

Algonquin Gas Transmission, LLC
890 Winter Street, Suite 320
Waltham, Massachusetts 02451

Prepared by

SWCA Environmental Consultants
8 Science Park Drive, Ste. 200
Scarborough, Maine 04074
www.swca.com

SWCA Project No. 68136

October 2023

CONTENTS

ATTACHMENTS

TABLES

1.0 PROJECT DESCRIPTION AND PURPOSE

Algonquin Gas Transmission, LLC (Algonquin), operates an existing interstate natural gas transmission system pursuant to the Natural Gas Act, 15 United States Code (USC) 717 et seq. and the Natural Gas Pipeline Safety Act, 49 USC 60101 et seq. Included in this interstate network is an existing six-inch diameter pipeline partially located in Portsmouth and Little Compton, Rhode Island that interconnects with Rhode Island Energy, the local gas distribution company. The existing pipeline, originally installed in 1954, is the sole source of natural gas for homes and businesses on Aquidneck Island.

As part of its obligation under federal law to maintain the safety and reliability of its facilities, Algonquin is required by U.S. Department of Transportation (USDOT) Pipeline and Hazardous Materials Safety Administration Regulations (49 Code of Federal Regulations [CFR] 192) to routinely monitor its pipelines in order to ensure the continued safe and reliable transmission of natural gas, protect the public and ensure Algonquin's compliance with federal pipeline safety regulations.

As part of its obligation under federal law to maintain the safety and reliability of its facilities, Algonquin conducts regularly scheduled internal inspections of its natural gas pipeline transmission systems using internal inspection tools commonly known as "pigs." These internal pipeline tools perform a variety of data collection functions as they pass through the pipe. Algonquin recently performed such an inspection of its existing 6-inch G-2 natural gas pipeline, and, as a result, identified a section of the existing G-2 pipeline that requires maintenance. The resulting G-2 Natural Gas Pipeline Maintenance Project (Project) involves the replacement of an approximately 9,920-foot section of pipeline using a combination of horizontal directional drill (HDD) and open cut method of construction. The section of pipeline that requires replacement is located in the Town of Portsmouth and Town of Little Compton, Newport County, Rhode Island.

Algonquin is submitting this Rhode Island Coastal Resources Management Council (CRMC) Freshwater Wetlands in the Vicinity of the Coast Permit Application for authorization under 650 RICR-20-00-9 and Coastal Application and Category B Coastal Application under 650-RICR-20-00-1. Provided with the application is the enclosed narrative, Permit Forms, and other requisite information (Attachments A-G).

1.1 Project Narrative

Algonquin is proposing to replace a total of approximately 9,920 feet of existing 6-inch diameter pipeline stretching from the east side of the Sakonnet River in Little Compton to Algonquin's existing Meter and Regulation Station 00013 (M&R Station 00013) in Portsmouth. The replacement pipeline segment will primarily be located within Algonquin's existing rights-of-way (ROW) in Portsmouth (west of the Sakonnet River) and Little Compton (east of the Sakonnet River). The objective of the Project is to replace the section of the existing G-2 pipeline requiring maintenance to ensure the continued safe and reliable transmission of gas. The replacement pipe will be 12-inch diameter and installed primarily within Algonquin's existing ROW. There are two separate HDD segments included in the Project; one HDD under the Sakonnet River and one HDD under Cotton Swamp. Approximately 7,339 feet of the

replacement pipe will be installed beneath the Sakonnet River using the HDD construction method. By using the HDD method, there are no anticipated impacts to the Sakonnet River as the replacement pipeline segment will be drilled as much as 210 feet beneath the riverbed, avoiding impacts on the banks of the river or excavation in the waterbody. The existing G-2 pipeline under the Sakonnet River will be grouted at each end and abandoned in place. A new aboveground facility, a small trap site, will be installed east of the Sakonnet River to facilitate the tie-in of the new pipeline with the existing pipeline and future pipeline inspections (See Drawing XXXX-C.501-XXX in Attachment B). The aboveground facility will be located approximately 240 feet from the Sakonnet River's top-of-bank. Approximately 628 square feet (0.01 acres) of new permanent easement will be required for the new above ground facility in Little Compton.

In addition to the pipe replacement under the Sakonnet River, Algonquin will also replace the remaining approximately 2,580 feet section of the existing 6-inch G-2 pipeline west of the Sakonnet River to Algonquin's existing M&R 00013. This section of pipeline will be replaced with 12-inch diameter pipeline, thus improving the overall G-2 system integrity and reliability to the surrounding area. This section will be replaced using a combination of HDD and open-cut method. The HDD will be utilized to install approximately 1,381 feet of pipeline under Cotton Swamp to avoid and minimize impacts. The remaining approximately 1,200 feet of existing pipeline will be replaced with 12-inch pipeline via open-cut method. These two sections of existing G-2 pipeline will be grouted at each end and abandoned in place. Aboveground and belowground modifications will be required at M&R 00013 to tie-in the replacement pipe with the existing facility. A vertical cathodic protection system, also called a deep well anode, will be installed to counteract the natural electrolytic condition in the soil that may cause ions to flow away from the pipe's surface, carrying microscopic metal particles, causing corrosion. The deep well anode will prevent this by forcing a low-voltage electrical current to flow toward the pipe, which opposes, or cancels out, any natural electrical flow away from the structure.

In order to safely and efficiently execute the Project, Algonquin will utilize a combination of its existing permanent easement and temporary workspace (TWS) to install the replacement pipe. In Little Compton, east of the Sakonnet River, Algonquin will utilize a total of approximately 9.36 acres of workspace; of which approximately 1.90 acres is the G-2 existing permanent easement, and an additional approximately 7.46 acres of TWS, located off West Main Road. Algonquin is proposing to install construction mats within the wetland area to West Main Road in Little Compton to avoid ground disturbance.

In Portsmouth, west of the Sakonnet River, Algonquin will utilize a total of approximately 6.44 acres of workspace; of which approximately 2.24 acres is the G-2 existing permanent easement, and approximately 4.20 acres of TWS located between Swan Drive and M&R 00013 off Old Mill Lane. Algonquin will install construction mats within wetland areas to minimize temporary impacts.

The proposed location of the Project is shown in Attachment A on the United States Geological Survey (USGS) Quadrangle excerpt and on aerial photography. Included in Attachment B are full-scale plan and profile sheets showing the proposed locations of the Project pipeline and

associated components, including the construction and operational pipeline ROWs, TWS, and access roads as described in the following sections.

1.2 Project Schedule

Construction of the Project is anticipated to begin in early 2024 once the necessary federal and state permits and other agency authorizations are acquired.

1.3 Project Land Requirements

The total workspace required for the Project is approximately 15.80 acres: 4.14 acres of workspace within the existing ROW and approximately 11.66 acres of TWS. This workspace includes all areas that will be disturbed during construction of the Project. The workspace land use consists primarily of existing permanent easement maintained at the herbaceous/shrub level, forested land, agricultural land, and residential land. Except for the private landowner access off Old Mill Lane, other access points are existing public roads or improved access drives that will require no modifications or upgrades.

The workspace in Little Compton off West Main Road consists primarily of agricultural land use. A review of historic aerial imagery shows that this area has been continually cultivated since at least 1985. A narrow row of trees adjacent to West Main Road will be removed and the roadside culvert will be extended to allow trucks and equipment to safely access the workspace. This workspace area will contain the Sakonnet River HDD exit point, new above ground trap site and workspace area necessary to assemble the replacement pipe to be pulled into the HDD bore under the Sakonnet River. Algonquin is proposing to install construction mats within the wetland area to West Main Road in Little Compton to avoid ground disturbance. The new aboveground facility, the trap site, will be installed primarily within the existing easement in an upland area greater than 200 feet from the bank of the Sakonnet River. The trap site will be used to receive and launch inspection tools to monitor the condition of the pipe. There is an existing permanent access road from West Main Road to the proposed aboveground facility and no improvements to that existing access road are anticipated. The trap site will be situated on an 85-foot by 30-foot compacted gravel area and surrounded by a security fence. An additional 15-foot by 50-foot graveled area outside of the fence line will be installed to facilitate personnel and equipment accessing the aboveground facility. See sheets XXXX-C.501-XXX4 and XXXX-C.501-XXX5 in Attachment B.

The workspace in Portsmouth off Swan Drive and Wampum Drive consists primarily of unmaintained gravel lot, with some areas of palustrine forested (PFO) and palustrine scrub shrub (PSS) wetland. A review of historical aerial imagery shows that this area has been in use as a storage and stockpile area accessed by an improved gravel road off Wampum Ave since as early as 1995. Equipment will access the workspace directly off Swan Drive, with smaller passenger vehicles and trucks potentially also using Wampum Drive, an existing gravel road from Indian Ave to the workspace. Tree clearing and minor grading will be required to safely utilize this workspace. Equipment operating within the wetland will utilize temporary construction mats to minimize temporary wetland impacts. The HDD entry point for the Sakonnet River HDD will be located in this workspace area. Equipment within the workspace will include the drilling rig and appurtenances for the bore under the Sakonnet River. This space will also be used to assemble the pipe that will be pulled back under Cotton Swamp. A short section, approximately 260 linear

feet, of open cut lift and relay between the two HDD tie in locations will be used to connect these sections of pipe together. A deep anode well will be installed to an approximate depth of 300 feet below ground surface in this workspace area. See sheet XXXX-C.502-XXX2 in Attachment B.

The workspace in Portsmouth off the landowner driveway extending from Old Mill Lane consists primarily of forested area and maintained lawn. Based on a review of historic aerial imagery, portions of this workspace area have been maintained as residential lawn since at least 1995. Tree clearing and minor grading will be required in order to safely utilize this workspace. Equipment operating within the wetland will utilize temporary construction mats to minimize temporary wetland impacts. This workspace area will contain the Cotton Swamp HDD entry point. Equipment operating within the workspace includes the drilling rig and appurtenances for the HDD below Cotton Swamp. This workspace will also be utilized for the open-cut replacement method that extends from this workspace area west to M&R 00013. The existing pipe within this open-cut section will be grouted at each end and abandoned in place. See sheet XXXX-C.502-XXX3 in Attachment B.

The workspace in Portsmouth off Old Mill Lane, east of M&R 00013, consists primarily of private landowner properties, industrial uses and a small area of forested wetland near M&R 00013. Based on a review of historical aerial imagery, the land use of this area, both north and south of Old Mill Lane, has not changed since the earliest clear photograph in 1995. Tree clearing and minor grading will be required to safely utilize this workspace. Equipment operating within the wetland will utilize temporary construction mats to minimize temporary wetland impacts. The workspace area will be utilized for the installation of the replacement pipe using subsurface boring methods for the section that crosses below Old Mill Lane to avoid cutting the road and impeding traffic. See sheet XXXX-C.502-XXX3 in Attachment B.

The workspace in Portsmouth located off Old Mill Lane, west of M&R 00013 is an existing graded, improved laydown area. A review of historical aerial shows that the land use of this parcel has not changed since the earliest clear photograph in 1995. It will be utilized for parking, unloading and stockpiling, and equipment storage. See sheet XXXX-C.502-XXX3 in Attachment B.

SWCA Environmental Consultants (SWCA) completed wetland and waterbody delineations for all workspace areas in April 2022, January and March 2023. Wetlands and waterbodies are identified on the figures in Attachment A and discussed in more detail in Section 2.

1.4 General Construction Procedures

The Project will be constructed in compliance with applicable federal regulations and guidelines, and the specific requirements of the necessary permits. Key federal requirements and guidelines include:

- 18 CFR Part 380 – Federal Energy Regulatory Commission's (FERC's) Regulations Implementing the National Environmental Policy Act (including § 380.15 – Siting and Maintenance Requirements);

- 49 CFR Part 192 – Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards;
- FERC's *Upland Erosion Control, Revegetation, and Maintenance Plan,* "FERC Plan" (FERC 2013a); and
- FERC's *Wetland and Waterbody Construction and Mitigation Procedures*, "FERC Procedures" (FERC 2013b).

The following sections identify the general construction procedures for routine pipeline construction.

1.4.1 Surveying

Prior to construction, the outside limits of the construction work areas, the centerline of the pipeline, road crossings, and temporary extra workspace will be surveyed and staked. The "One Call" system will be contacted and underground utilities (e.g., cables, conduits, and pipelines) will be located and flagged. At the request of the landowners, ground-penetrating radar may also be used to identify underground utilities. Stakes and markings will be maintained as necessary throughout construction to reduce the potential for construction activities to extend beyond certificated construction limits. Affected landowners that requested prior notification will be notified prior to surveying and staking of the centerline and workspaces.

1.4.2 Clearing Operations

In general, clearing will be minimized for Project construction since the existing pipeline ROW, agricultural land and other previously cleared or improved areas were selected as areas for TWS, as the Project allowed. Tree clearing will be limited to only the defined workspace areas needed to efficiently and safely execute the Project. The primary vegetation clearing work for the Project will occur in the TWS beyond existing maintained ROWs. Clearing limits will be identified and flagged in the field prior to beginning clearing operations.

In wetlands, vegetation will be cut just above ground level, leaving existing root systems intact. Stumps, if present, will not be removed from the wetland, with the exception of those where the existing conditions present a safety hazard for construction. Treating stumps and root systems in this manner will help stabilize the soil and promote regeneration by existing root stock. Woody debris will be removed from the wetland and stockpiled within an upland area of the ROW for disposal. Wood chips will not be spread in wetlands or used as fill.

In uplands, tree stumps will be left in the temporary workspace wherever practicable to encourage natural revegetation. If necessary, stumps will be removed from the ROW to approved disposal locations. Brush and tree limbs will be chipped and removed from the ROW for approved disposal.

The cleared width within the ROW and temporary construction workspace will be kept to the minimum that will allow for spoil storage, staging, assembly of materials, and all other activities required to efficiently and safely construct the pipeline.

1.4.3 Installation and Maintenance of Erosion Control Devices

Following clearing and before grading activities, erosion controls will be installed at the required locations as outlined in the Project Drawings in Attachment B. Examples of common erosion control devices include silt fence, straw wattles, and hay bales used as described in Algonquin's Erosion and Sediment Control Plan (E&SCP) in Attachment C.

In addition, Algonquin will construct the Project in accordance with the E&SCP provided in Attachment C. The E&SCP has been prepared for use by Algonquin and its contractors as a guidance manual for minimizing erosion of disturbed soils and transportation of sediments off the ROW and into sensitive areas (wetlands, streams, and residential areas) during pipeline construction. The procedures developed in the E&SCP represent Algonquin's best management practices (BMPs) and are designed to accommodate varying field conditions while maintaining rigorous minimum standards for the protection of environmentally sensitive areas.

1.4.4 ROW and Temporary Construction Workspace Grading

The sections of the replacement pipe installed using traditional open cut methods will occur within the existing easement, which has been previously disturbed by the installation of the existing pipeline. Therefore, grading within the ROW will be minimal, however, limited workspace grading may be required in the TWS to allow for safe passage of equipment and to prepare a work surface for pipeline installation activities. Typically, grading is completed using bulldozers. If an area has large boulders that require removal, additional equipment, such as excavators or backhoes, may be utilized. A travel lane or traffic control will be maintained to allow for the passage of daily traffic.

1.4.5 Horizontal Direction Drill

The HDD method is a trenchless installation process by which the pipeline is installed beneath obstacles or sensitive areas using equipment and techniques derived from oil well drilling technology. HDD crossings minimize disturbance to the existing environment within the HDD alignment relative to conventional open trench operations. The HDD method will involve establishing land-based staging areas along both sides of the proposed crossing. The process will commence with boring a pilot hole beneath the waterbody and then enlarging the hole with one or more passes of a reamer until the hole is the necessary diameter to facilitate the pull-back (installation) of the pipeline. Once the reaming passes are completed, a prefabricated pipe segment will then be pulled through the hole to complete the crossing. At each end of the HDD, the replacement pipe will be tied-in to either the existing pipeline (such as in Little Compton) or tied-in to the newly installed open-cut replacement pipeline (such as in Portsmouth).

The HDD rig and associated equipment (e.g., control cab, drill string pipe storage, office and tool storage trailers, power generators, bentonite storage, bentonite slurry mixing equipment, slurry pump, cuttings separation equipment, and heavy construction equipment) will be set up on both sides of the crossing. For the Sakonnet River HDD, the HDD entry point in Portsmouth will be located within the TWS off of Swan Drive and the Sakonnet River HDD exit in Little Compton will be located within an agricultural field. For the Cotton Swamp HDD, the HDD entry point is located in Portsmouth within TWS west of Cotton Swamp, with the exit point located in the TWS off Swan Drive (see Project Drawings, Attachment B).

Due to the specialized equipment and area requirements associated with HDD technology, workspace will be required to temporarily stage and successfully operate the equipment. Drilling will progress beneath the Sakonnet River from west to east, and beneath Cotton Swamp from southwest to northeast. The pilot hole is drilled using a rotating, small-diameter drill string and a drill bit consisting of an asymmetric jetting head. The position of the steering head is oriented by an operator or "pilot" from a remote drill cab. The position of the drill string is electronically monitored during the drilling operation. Directional corrections are made as necessary to ensure that the drill string maintains the desired profile and alignment. Enlarging the pilot hole is an incremental process accomplished with one to several reaming passes, depending upon the proposed pipeline diameter and the subsurface geology. The rotating reaming/cutting tool is attached to the drill string at the exit point and drawn back toward the drilling rig situated at the entry point of the pilot hole. Drill pipe is added behind the reaming tool as it progresses toward the drill rig to ensure that a continuous drill string is maintained in the drilled hole.

Workspace will be required along the exit side of the crossings to prefabricate the pipeline into continuous sections in preparation for pulling the pipe back into the bore. Once assembled, the pipeline is placed on pipe rollers for the pullback operation. The fabricated pipe will be hydrostatically tested prior to pullback. The prefabricated pipeline is attached to the drill string at the exit point and drawn back toward the drilling rig at the entry location. The installed HDD pipe will be hydrostatically tested for a final time in conjunction with the final hydrostatic test of the Project.

The HDD method utilizes a drilling fluid comprised of a water and bentonite clay mixture (typically a 97:3 mixture), often referred to as a bentonite slurry, to facilitate the drilling process. There are several additives that may be included in the bentonite slurry, and some may be used for the HDD associated with the Project if necessary. Bentonite clay is classified as a non-toxic and non-hazardous substance. Due to the unique characteristics of bentonite, the slurry is capable of absorbing 10 times its own weight in water and swells up to 18 times its dry volume. The combined bentonite and water mixture serves the following purposes: lubricate and cool the drill head; seal and fill the porous spaces on the circumference of the drilled hole; form a cake-like substance to help prevent the walls of the drill hole from collapsing inward; and suspend the cuttings for removal through the drilling process. Algonquin will obtain water from municipal or commercial sources for the HDD process.

While the HDD method is a proven technology, there are certain temporary impacts that could occur as a result of the drilling such as the inadvertent release of drilling fluid, which is a slurry of bentonite clay and water that is classified as non-toxic to the aquatic environment and is a non-hazardous substance. Accordingly, Algonquin has developed a Best Drilling Practices Plan & Monitoring and Clean-up of Horizontal Directional Drilling Inadvertent Returns (BDP Plan) for monitoring the HDD program for the Project (see Attachment D). This BDP Plan will be kept on-site and will be available and implemented by all proposed personnel described in the BDP Plan.

1.4.6 Open Trench Replacement

Algonquin will replace the existing G-2 pipeline with 12-inch diameter pipe that ties the Sakonnet River HDD to the Cotton Swamp HDD, and the Cotton Swamp HDD to M&R 00013. The existing pipeline will be excavated and abandoned, and the replacement pipe will be

installed adjacent to the existing pipe. Open trench method is an effective way to replace existing pipelines in areas without significant sensitive resources, such as the section of this Project from Cotton Swamp west to M&R 00013.

Dewatering the pipeline trench may be required in areas with a high-water table or after heavy rain. Trench water will be discharged into well-vegetated upland areas using filter bags or properly constructed dewatering structures to allow the water to infiltrate back into the ground. If trench dewatering is necessary near a waterbody, the removed trench water will be discharged into an energy dissipation and sediment filtration device, such as a geotextile filter bag or straw bale structure. The device will be located away from the water's edge to prevent heavily silt-laden water from flowing into nearby waterbodies in accordance with the E&SCP and applicable permits. Contaminated soil or groundwater, as determined through preconstruction pre-characterization, will be managed in accordance with the Project's Health and Safety Plan. Algonquin does not anticipate the need for blasting along the proposed Project.

Following excavation of the trench, pipe segments will be placed and welded together into continuous lengths known as strings, fitted so the pipe fits the horizontal and vertical contours of the excavated trench. The pipe will be welded, inspected, coated, and placed into the trench. Final welds are made in the trench to complete and tie in the new section of pipe.

1.4.6.1 Dry Soil Construction Procedures

In uplands or wetlands with firm substrates, topsoil will be segregated from excavated subsoil to maintain the native seed bank and root propagules, and excavated material will be temporarily stockpiled alongside the trench to minimize equipment and material travel. Temporary trench plugs will be installed in the trench as necessary and at the edges of wetlands, if the possibility exists for sediment-laden water to flow from uplands down the trench and into the wetland. Silt fences and/or straw bales will be installed at the edges of the construction work area. Original topography and contours will be restored to pre-construction conditions to the extent practicable following construction completion.

1.4.6.2 Saturated Soil Construction Procedures

If wetland soils are inundated or saturated to the surface, the pipeline trench will be excavated across the wetland by equipment supported on construction mats to minimize temporary disturbance to wetland soils. In wetlands with firm substrates, the top 12 inches of wetland soil over the trench line will be segregated. Trench spoil will be temporarily piled in a ridge along the pipeline trench. Gaps in the spoil pile will occur at appropriate intervals to provide for natural circulation or drainage of water. While the trench is excavated, the pipeline will be assembled in a staging site located in an upland area, where practicable. If conditions are dry enough within the wetland, pipe fabrication will occur in the wetland. Because the HDD method will be used to install under the wettest portions of the wetland, Algonquin does not anticipate installation of pipes in trenches that entirely submerged and standard dewatering practices will suffice. A complete description of construction methods can be found in the E&SCP (see Attachment C).

1.4.7 Boring beneath Old Mill Lane

Pipeline installation beneath Old Mill Lane will be accomplished using standard boring techniques. Additional excavation to widen the trench on each side of the road will occur as needed to provide adequate space for the boring machinery. The road will be bored under using a straight-line boring machine and the replacement pipeline will be installed under the road. Utilizing the boring technique will allow the pipeline to be installed without the need to close the road to execute the open cut installation method.

1.4.8 Cleaning

Following installation, the pipeline will be internally cleaned with devices referred to as pipeline "pigs." A launching and receiving manifold are installed on each end of the pipeline section and a pig is propelled by compressed air through the pipe, removing dirt, water, or debris inadvertently collected within the pipeline during installation.

1.4.9 Hydrostatic Testing

After cleaning, the pipeline will be pressure tested in accordance with USDOT 49 CFR Part 192 regulations and Algonquin's requirements to ensure its integrity for the intended service and operating pressures. The newly installed pipe segment is filled with clean water and pressurized for the prescribed period of time. At the completion of the hydrostatic test, the pressure is released and the water is removed from the pipeline. Hydrostatic test water will be discharged within suitable vegetated upland areas in accordance with the E&SCP and applicable federal and state approvals. Drying pig runs will follow the dewatering of the tested section and will remove residual water from the pipeline. Drying pigs are propelled through the pipeline with compressed air. Additional drying pig runs will be completed as necessary until the Project's specified level of dryness is obtained.

1.4.10 Backfilling

All suitable material excavated during trenching will be replaced back into the trench. In areas where excavated material is unsuitable for backfilling, additional select fill may be required. The top of the trench may be slightly crowned to compensate for settling, except for paved areas where standard compaction methods and/or flowable fill will be employed. The topsoil will then be spread across the graded construction ROW when applicable. The soil will be inspected for compaction and scarified as necessary.

1.4.11 Hazardous Material Spills

Algonquin has prepared a Spill Prevention Control and Countermeasure Plan (SPCC Plan) to address the handling of construction fuel and other materials. The SPCC Plan provides a set of minimum requirements to be used by the contractor in developing the contractor's own Project-specific SPCC Plan. The SPCC Plan is included in Attachment C. Except in circumstances specified in the SPCC Plan, potential impacts to water quality will be avoided while work is being performed in wetlands and other waterbodies by implementing the following measures:

- Construction materials, fuels, etc. will not be stored within wetlands or within 100 feet of stream or wetland system, except under limited, highly controlled circumstances.

- Construction equipment will not be refueled within wetlands or within 100 feet of any stream or wetland system, except under limited, highly controlled circumstances and under direct supervision of the Environmental Inspector.
- Construction equipment will not be washed in any wetland or watercourse.
- Equipment will be well maintained and checked daily for leaks.

1.4.12 Restoration and Revegetation

The cleanup crew will complete the restoration and revegetation of the construction ROW including the TWS. Final cleanup (including final grading) and installation of permanent erosion control measures within 20 days after the trench is backfilled, weather and soil conditions permitting. In conjunction with backfilling operations, woody material and construction debris will be removed from the ROW. The ROW will be fine graded to prepare for restoration. Fences, sidewalks, driveways, stone walls, and other structures will be restored or repaired as necessary.

Revegetation will be completed in accordance with permit requirements and written recommendations on seeding mixes, rates, and dates received from state or federal agencies and in compliance with the E&SCP. The ROW will be seeded within six working days following final grading, weather and soil conditions permitting. Alternative seed mixes specifically requested by the landowner or required by agencies may be used. Soil disturbance that occurs outside the permanent seeding season or bare soil left unstabilized by vegetation will be mulched in accordance with the E&SCP.

1.4.13 Abandonment of Existing Pipeline

The sections of the existing G-2 pipeline that stretch under the Sakonnet River and Cotton Swamp will be grouted at each end and abandoned in place, thus reducing disturbance to these sensitive environmental resources. Algonquin will also grout each end of the existing G-2 pipeline between Cotton Swamp and M&R 00013, thus reducing impacts to surrounding landowners. The abandoned pipe will be filled with grout and each end will be permanently sealed.

2.0 REGULATORY JURISDICTION – WETLAND/WATERBODY RESOURCES AND PROJECT IMPACTS

Wetlands and surface water resources along the Project were initially identified using available mapping and online sources and were subsequently verified and surveyed during field delineations. Field surveys were conducted by SWCA in April 2022, January and March 2023 to determine the limits of wetlands and waters within the Project.

The State of Rhode Island has two agencies tasked with management of the natural resources of the State. The CRMC has the authority to manage the coastal resources of the state including tidal waters, coastal ponds, and wetlands in the vicinity of the coast. The Rhode Island Department of Environmental Management (RIDEM) has authority to manage the inland resources of the state including freshwater waters, ponds and inland wetlands.

Since the Project includes temporary impacts to resources jurisdictional to both the CRMC and RIDEM, Algonquin submitted a letter to CRMC in accordance with 250-150-15 Rhode Island Code R §1.9 on May 19, 2023 to request a jurisdictional determination. The CMRC responded that they will be the leading state permitting agency. Therefore, this application has been prepared in accordance with the Rules and Regulations Governing the Protection and Management of Freshwater Wetlands in the Vicinity of the Coast (650-RICR-20-00-9) requesting authorization for Algonquin to complete the proposed maintenance work along its existing G-2 pipeline.

2.1 Jurisdictional Areas

The Project proposes temporary impacts to jurisdictional areas as defined pursuant to 650-RICR-20-00-9.4.41 and as outlined in Rhode Island General Laws § 2-1-20(9), including:

- freshwater wetlands (Section 2.1.1),
- buffers (Section 2.1.2),
- areas subject to storm flowage (Section 2.1.3), and
- contiguous areas that extend outward (Section 2.1.4)(RIDEM, 2022).
    - two hundred feet from the edge of a river or stream greater than 10 feet in width,
    - one hundred feet for streams less than 10 feet in width, and
    - one hundred feet from the edge of all freshwater wetlands

Additionally, as defined at 650-RICR-20-00-9.4.72, the Project will temporarily impact one stream (Section 2.1.5). Temporarily impacted jurisdictional areas are further discussed in the sections below.

2.1.1 Freshwater Wetlands

The identification of freshwater wetlands in the Project workspace involved a two-phased approach consisting of reviewing available resource mapping such as USGS topographic quadrangle mapping, aerial photography mapping, National Wetland Inventory maps (USFWS 2023), and Natural Resource Conservation Service Soil Surveys; followed by an on-site determination of the freshwater wetland boundary. Wetland surveys were performed in accordance with 250-RICR-150-15-3.21. Wetlands identified in the field were classified

according to the Cowardin System, as described in *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1997) and flagged with sequential alpha-numeric wetland flags placed along the boundary. The flags were then located using a submeter accuracy global positioning system (GPS) unit.

SWCA completed field surveys for freshwater wetlands in April 2022, January and March 2023. As a result of the field survey, four freshwater wetlands were identified within the Project area; two palustrine emergent wetlands (PEM), one PSS, and one PFO. Wetland data forms and photos are provided in Attachments E and F, respectively. All wetlands were identified as freshwater wetlands and no evidence of tidal influence was observed.

The PEM wetland communities consist of a prevalence of wetland areas dominated by non-woody vegetation less than three feet in height. Dominant herbaceous species include soft rush (*Juncus effusus*) and tussock sedge (*Carex stricta*). Hydric soil is characterized by Depleted Matrix (F3) and typical hydrology includes saturation. This wetland classification is consistent with the Emergent Wetland: Emergent marsh/wet meadow (EMA) wetland type categorized by RIDEM Office of Water Resources (OWR) (RIDEM, 2001 and RIDEM, 2023)

The PFO wetland community consists of a wetland area dominated by woody vegetation greater than 3 inches diameter at breast height. Dominant species include Russian olive (*Elaeagnus angustifolia*), multifloral rose (*Rosa multiflora*), wrinkle leaf goldenrod (*Solidago rugosa*) and common nettle (*Urtica dioica*). Hydric soil is characterized by Redox Dark Surface (F6) and typical hydrology includes surface water, high water table, and saturation. This wetland classification is consistent with the Forested Wetland: Deciduous (FOB) wetland type categorized by RIDEM OWR (RIDEM, 2001 and RIDEM, 2023)

The PSS wetland communities consist of a wetland area dominated by woody species less than 20 feet tall and less than 3 inches diameter at breast height. The dominant shrub species is gray willow (*Salix cinerea*). Hydric soil is characterized by Loamy Mucky Mineral (F1) and typical hydrology includes surface water and saturation. This wetland classification is consistent with the Scrub-shrub Wetland: Shrub Swamp (SSA) wetland type categorized by RIDEM OWR (RIDEM, 2001 and RIDEM, 2023)

Project impacts to wetlands will be temporary in nature and no permanent impacts are proposed. Algonquin has designed the Project to minimize temporary impacts to wetlands to the extent practical primarily through the use of the HDD methodology, in addition to utilizing industry standard best management practices. Temporary impacts to wetlands that overlap with workspace will be minimized by the use of construction mats. Following the completion of the Project, cleared forested wetlands utilized for TWS will be allowed to revegetate to a forested cover type. There will be no permanent loss of wetlands or permanent conversion of wetland cover type. The wetlands temporarily impacted by the Project are identified in Table 2-1.

Table 2-1. Wetlands within the Project Workspace

Wetland Map ID	Wetland Type*	Data Point Latitude & Longitude	Temporary Wetland Impacts
LCW2	PEM	41.530387, -71.198581	0.75 Acres
W1	PFO/PEM/PSS	41.524388, -71.234694	1.10 Acres
W3	PFO	41.522652, -71.239551	0.06 Acres
W4	PSS	41.522279, -71.242376	0.13 Acres

**PEM = palustrine emergent; PSS = palustrine scrub-shrub; PFO = palustrine forested*

2.1.2 Buffers

Pursuant to 650-RICR-20-00-9.4.9 and in accordance with Rhode Island General Laws § 2-1-20(4), a buffer is defined as *"an area of undeveloped vegetated land adjacent to a freshwater wetland that is to be retained in its natural undisturbed condition or is to be created to resemble a naturally occurring vegetated area, for the purpose of mitigating the negative impact of human activities on wetland functions and values."* Based on the Revised RIDEM Freshwater Wetland Regulations, January 2022, the wetlands in Little Compton are within River Protection Region 1 and have an associated buffer of 50 feet, and the wetlands in Portsmouth are in River Protection Region 2 and have an associated buffer of 75 feet (RIDEM, 2021 and RIDEM, 2022a).

Although the wetlands temporarily impacted by the Project have either a 50 or 75-foot buffer, not all of the areas within the designated buffer meet the definition of a buffer. In Little Compton, wetland LCW2 is an emergent wetland largely surrounded by active agricultural fields and fallow areas that experience regular disturbance and do not meet the definition of a buffer. In Newport, the workspace located off Swan Drive is a previously disturbed lot with improved roads and gravel lay-down areas within the buffer, therefore not meeting the definition of buffer. Similarly, the workspace west of Cotton Swamp includes large areas of maintained lawns for nearby residences, therefore not meeting the buffer definition. The areas of buffer that meet the definition and remain in a "natural undisturbed condition" are identified in Table 2-2 and are represented in the figures in Appendix A. Following the completion of the Project, wetland buffers will be restored to their pre-construction conditions and vegetation cover types, therefore there will be no permanent change in existing wetland buffers as a result of the Project.

Table 2-2. Buffers within the Project Workspace

Wetland ID	Region	Buffer Zone	Temporary Buffer Impacts
LCW2	River Protection Region 1	50 feet	N/A*
W1	River Protection Region 2	75 feet	0.49 acres
W3	River Protection Region 2	75 feet	0.29 acres
W4	River Protection Region 2	75 feet	0.34 acres

*the "buffer" surrounding LCW2 consists of active agricultural and maintained fallow land, therefore not meeting the definition of buffer per 650-RICR-20-00-9.4.9 and in accordance with Rhode Island General Laws § 2-1-20(4),

2.1.3 Areas Subject to Storm Flowage

Pursuant to 650-RICR-20-00-9.4.6 and in accordance with Rhode Island General Laws § 2-1-20(2), an area subject to storm flowage includes *"drainage swales and channels that lead into, out of, pass through, or connect other freshwater wetlands or coastal wetlands, and that carry flows resulting from storm events, but may remain relatively dry at other times."* As identified during the delineation and represented on the figures in Attachment A, two small drainages that meet the definition of an area subject to storm flowage were identified within the interior of Cotton Swamp. Since the Project will avoid impacts to these resources by the use of HDD, there will be no impact to areas subject to storm flowage as a result of the Project.

2.1.4 Contiguous Areas that Extend Outward

Jurisdictional areas as defined pursuant to 650-RICR-20-00-9.4.41 and as outlined in Rhode Island General Laws § 2-1-20(9), include *"two hundred feet from the edge of a river or stream"* and "*one hundred feet from the edge of all other freshwater wetlands.*

Per 650-RICR-20-00-9.4.64 and as outlined in Rhode Island General Laws § 2-1-20(13), a river is defined as *"a body of water that is designated as a perennial stream by the United States Department of Interior Geologic Survey on 7.5-minute series topographic maps, and that is not a pond as defined within this Part."* Although the Sakonnet River will not be impacted by the Project, the Sakonnet River is located within 200 feet of the workspace in Little Compton. The temporary impacts within the 200-foot contiguous area associated with the Sakonnet River is identified in Table 2.3 below and represented in the figures in Attachment A. Following the completion of the Project, the 200-foot river contiguous area impacted by the Project will be restored to pre-construction conditions and vegetation cover types, therefore there will be no permanent change in the exiting 200-foot river contiguous area as a result of the Project.

Per 650-RICR-20-00-9.4.72, a stream is *"any flowing body of water or watercourse other than a river that flows long enough each year to develop and maintain a channel and that may carry groundwater discharge or surface runoff. Such watercourses may be intermittent streams and may not have flowing water during extended dry periods but may contain isolated pools or standing water."* A RIDEM summary and fact sheet addressing changes to freshwater wetland rules effective in 2022 clarify that streams less than 10 feet wide have a buffer zone of 100 feet (RIDEM, 2021 and RIDEM, 2022a). For the Project, one stream located in Portsmouth was delineated within 100 feet of the workspace. The temporary impacts within the 100-foot contiguous area associated with S2 are identified in Table 2.3 below and represented in the figures in Attachment A. Following the completion of the Project, the 100-foot stream contiguous area impacted by the Project will be restored to pre-construction conditions and vegetation cover types, therefore there will be no permanent change in the existing 100-foot stream contiguous area as a result of the Project.

As identified in Section 2.1.1, four freshwater wetlands will be temporarily impacted by the Project. Pursuant to 650-RICR-20-00-9.4.41 and as outlined in Rhode Island General Laws § 2-1-20(9), these freshwater wetlands have an associated 100-foot contiguous area. The temporary impacts to the 100-foot contiguous area are identified in Table 2.3 below and represented in the figures in Attachment A. As stated previously, following the completion of the Project, the 100-foot freshwater wetland contiguous area impacted by the Project will be restored to pre-construction conditions and vegetation cover types, therefore there will be no permanent change in the exiting 100-foot freshwater wetland contiguous area as a result of the Project.

Table 2-3. Contiguous Areas within the Project Workspace

Resource ID	Region	Contiguous Area	Contiguous Area Impacts
Sakonnet River	River Protection Region 1	200 feet	0.49 Acres
LCW2	River Protection Region 1	100 feet	0.90 Acres
W2	River Protection Region 2	100 feet	0.49 Acres
W3	River Protection Region 2	100 feet	0.29 Acres

Resource ID	Region	Contiguous Area	Contiguous Area Impacts
W4	River Protection Region 2	100 feet	0.51 Acres
S2	River Protection Region 2	100 feet	0.54 Acres

2.1.5 Streams & Rivers

In accordance with the definitions in Section 2.1.4, stream and rivers within the Project workspace were identified as part of SWCA's delineations in 2022 and 2023. Field data was collected on each stream and river including flow type (tidal, perennial, intermittent, or ephemeral), substrate type if observable (mud/silt, sand, gravel, large rock, boulder, and/or bedrock), and channel width and depth (if observable).

As a result of the delineations completed in 2022 and 2023, one freshwater stream was identified within the Project workspace. The stream is located in Portsmouth within Cotton Swamp. One tidal river, Sakonnet River, is located in close proximity to the Project workspace in Little Compton but will not be impacted by the Project. The stream that will be temporarily impacted by the Project is identified in Table 2.4 and represented in the figures in Attachment A. Following the completion of the Project, the stream temporarily impacted by the Project will be restored to pre-construction conditions, therefore there will be no permanent impact to the stream as a result of the Project.

Table 2-4. Waterbodies within the Project Workspace

Waterbody ID	Waterbody Name	Latitude & Longitude	Waterbody Type	Survey Area
S2	UNT*	41.52426, -71.23511	Freshwater Non-Tidal	West - Portsmouth

**UNT = unnamed tributary*

2.2 ROW Maintenance

Minor, long-term impacts are associated with pipeline operations and maintenance and typically include periodic clearing of vegetation within the permanent ROW. Vegetation maintenance within the permanent ROW is required to assist with periodic monitoring and surveillance efforts, and to comply with the USDOT Safety Standards (49 CFR Part 192). In wetlands, typically up to a 30-foot corridor centered on the pipeline will routinely be cleared of woody growth. A 10-foot strip centered over the pipeline will be maintained in an herbaceous state on an annual basis. Trees greater than 15 feet in height and within 15 feet of either side of the pipeline will be removed periodically. Since the Project is largely within the existing Algonquin ROW, which is already subject to vegetation maintenance, insignificant additional vegetation maintenance within jurisdictional areas is expected to be required during operations. Therefore, continued, necessary vegetation maintenance activities are not expected to alter jurisdictional areas.

3.0 THREATENED AND ENDANGERED SPECIES

The Endangered Species Act (ESA) of 1973 (P.L. 93-205 of 1973, codified as amended at 16 United States Code (USC) §§1531-1544) protects federally listed threatened and endangered (T&E) fish, wildlife, plants, and invertebrates. The ESA states that T&E plant and animal species are of aesthetic, ecological, educational, historic, and scientific value to the U.S., and protection of these species and their habitats is required. A federally listed endangered species is one that is in danger of extinction throughout all or a significant portion of its range. A federally listed threatened species is likely to become endangered in the foreseeable future throughout all or a significant portion of its range. The United States Fish and Wildlife Service (USFWS), responsible for terrestrial and freshwater species, and the National Oceanographic and Atmospheric Administration Division of Marine Fisheries (NOAA Fisheries), responsible for marine species, jointly administer the law.

Protection is also afforded to "critical habitat" under the ESA. Critical habitat is defined by the USFWS as "the specific areas within the geographic area, occupied by the species at the time it was listed, that contain the physical or biological features that are essential to the conservation of endangered and threatened species and that may need special management or protection." Critical habitat may also include areas that were not occupied by the species at the time of listing but are essential to its conservation.

In addition to federal law, Rhode Island has passed the Rhode Island State Endangered Species Act, Title 20 of the General Laws of the State of Rhode Island, to protect federally threatened or endangered species and other species native to Rhode Island and are globally rare or threatened.

Algonquin consulted with the USFWS, NOAA Fisheries and Rhode Island Natural Heritage Survey (RINHS) to determine if any federally or state listed T&E species their designated critical habitats occur within the Project area. Copies of relevant agency correspondence, including consultation letters and electronic mail, are contained in Attachment G.

3.1 Federal-listed Species

3.1.1 U.S. Fish and Wildlife Service

According to USFWS Information for Planning and Conservation (IPaC) online tool, the endangered northern long-eared bat (*Myotis septentrionalis*) and endangered roseate tern (*Sterna dougallii*) may occur within the Project area (USFWS, 2023). USFWS lists white-nose syndrome, a deadly disease affecting cave-dwelling bats, as the predominant threat to northern long-eared bat, especially throughout the northeast. Algonquin completed the Rangewide Determination Key for Northern Long-Eared Bats, which identified that the Project does not intersect an area where northern long-eared bat is likely to occur. Therefore, Algonquin generated a no effect determination letter for the Project which is included in Attachment G.

The endangered roseate tern is a shore bird which feeds by plunge-diving for fish, typically in marine waters. Breeding is done in coastal and island colonies, laying one to three eggs in ground scraped nests. USFWS lists historic hunting, lack of suitable breeding sites, and nest predation as the predominant threats to the roseate tern. Based on lack of breeding habitat and

total avoidance of the shoreline and banks, the Project is anticipated to have no effect on this species. Additional information can be found in the Section 7 Endangered Species Act Species Determination Table in Attachment G.

3.1.2 National Marine Fisheries Service

Based on information received from the National Marine Fisheries Service (NMFS), eight threatened or endangered species under the jurisdiction of the NMFS may occur within the area of the Project Site (NOAA, 2022). These species are listed in Table 3-1 below.

Table 3-1. Federally Endangered Marine Species that may Occur within the Project Area

Scientific Name	Common Name
Acipenser oxyrinchus	Atlantic sturgeon
Acipenser brevirostrum	Shortnose sturgeon
Eubalaena australis	Right whale
Balaenoptera physalus	Fin whale
Chelonia mydas	Green sea turtle
Lepidochelys kempii	Kemp's ridley sea turtle
Dermochelys coriacea	Leatherback sea turtle
Caretta caretta	Loggerhead sea turtle

Due to the use of the HDD and avoidance of direct impacts to the Sakonnet River, no effect to these species is anticipated as a result of the Project. Details on these species can be found in the Section 7 Endangered Species Act Species Determination Table in Attachment G.

3.1.2.1 Fish and Wildlife Coordination Act

The Sakonnet River is also a migratory pathway and spawning, nursery and forage habitat for anadromous fishes including alewife (RIDEM, 2022b) and Atlantic herring (NOAA, 2021 & NOAA, 2023). Due to the use of the HDD and avoidance of impact to the Sakonnet River, seasonal restrictions to protect the migration and spawning of these species are not applicable to this Project.

3.1.2.2 Essential Fish Habitat

Algonquin utilized the NOAA online Essential Fish Habitat (EFH) mapping tool to determine if the Project area is within EFH for any of the species for which EFH has been established. The section of the Sakonnet River that intersects the Project area has been designated as EFH. The directional drill entrance and exit points are not within the waters of the Sakonnet River and an inadvertent release plan is in place, therefore impact to EFH is not expected.

3.2 State-listed Species

Based on the June 19, 2023 RINHS response, three species of state concern were identified as potentially present within the Project area. The RINHS review did not result in the identification of any protected plants. Table 3-2 lists the site-based RIDEM species potentially present. A copy of the RINHS response letter is provided in Attachment G.

Table 3-2. Rhode Island State-Listed Species Potentially Present within the Project Area

Scientific Name	Common Name	Last Observed	State Status	Federal Status
Lithobates pipens	Northern Leopard Frog	2010	State Concern	Not Listed
Cistothorus palustris	Marsh Wren	1984	State Concern	Not Listed
Porzana carolina	Sora	1984	State Concern	Not Listed

3.2.1 Northern Leopard Frog

The northern leopard frog is a small 2 – 3 ½ inch frog with a large, somewhat fragmented, range including all provinces of Canada, all the northern United States and large portions of the southwestern United States. The northern leopard frog is common across much of its eastern range; however, the western population is in decline. Habitat requirements include permanent standing water for overwintering, permanent or semi-permanent pools lacking a fish population for breeding, and wet meadows and upland fields for foraging (RIDEM, 2022c).

The workspace along the route primarily impacts PSS wetlands within the ROW, PFO wetlands outside the permanent ROW, and upland areas maintained as residential lawns. The frogs avoid heavily treed areas. Lawns may increase foraging efficiency; however, the frogs prefer foraging habitat with medium to high height herbaceous areas with some leaf litter to maintain an adequate humidity and provide cover from predators (SPCAP, 2018). The Project does not impact the preferred foraging habitat. No areas of permanent standing water, which may be used as overwintering areas, or amphibian breeding habitat, including vernal pools, will be impacted by the project. Therefore, due to the lack of suitable habitat and temporary nature of the Project, Algonquin has determined the Project will not impact the long-term viability of the northern leopard frog population.

3.2.2 Marsh Wren

The marsh wren is a small reddish-brown wren with a thin bill, short wings, and short tail. It is considered a migratory typical with a large range (Audubon, 2023). Rhode Island is within the common breeding area, along with areas along the Atlantic shore from Maryland to Maine, areas around the great lakes including New York, Ohio, Michigan, Wisconsin, and Indiana, and large areas in North and South Dakota, Nebraska, Montana, Oregon, and Washington. The Project is in a range commonly used by the marsh wren for breeding, with the birds migrating to more southern states for overwintering.

Typical habitat includes wetlands filled with cattails, bullrushes, and reeds. These birds build nests attached to and supported by standing cattails or other herbaceous vegetation between 1 and 3 feet above the water, with males claiming and defending territory. Foraging includes taking insects from the stems of marsh plants and the ground in dense, low growth (Audubon, 2023a). Breeding habitat is not found within the Project area. The workspace and TWS include maintained upland lawns, forested uplands, PFO, and PSS. Therefore, due to the lack of suitable habitat and temporary nature of the Project, the Project will not impact the long-term viability of the marsh wren population.

3.2.3 Sora

The sora is a migratory bird that occurs throughout most of North America. Breeding habitat extends from New England and Nova Scotia to the Southern Yukon and Northwest Territories, south to New Mexico. The Project is in the sora's breeding range, with the birds migrating to southern coastal states to overwinter. Typical breeding habitat includes herbaceous wetlands, with preference for wetlands containing a standing water component between 1 and 2 feet deep, though sora can also utilize flooded forested areas. The sora diet includes insects, snails, and seeds, typically collected by wading or ground foraging (Audubon, 2023b). Typical breeding and foraging habitat are not found within the Project area. The workspace and TWS include maintained upland lawns, forested uplands, PFO, and PSS. Therefore, due to the lack of suitable habitat and temporary nature of the Project, the Project will not impact the long-term viability of the sora population.

3.3 Bald Eagle

Although the Bald Eagle (*Haliaeetus leucocephalus*) was removed from the federal list of T&E species by the USFWS on July 9, 2007 (USFWS, 2007), it continues to be protected under the Bald and Golden Eagle Protection Act and the Migratory Bird and Treaty Act. These federal laws prohibit killing, selling, or harming eagles or their nests and also protect eagles from disturbances that may result in injury, decreased productivity, or cause nest abandonment.

No bald eagle nests have been identified within the vicinity of the Project. As a result, no impacts to bald eagles are anticipated.

3.4 Migratory Birds

The Project will not involve in-water work and will be constructed under the Sakonnet River utilizing HDD methodologies. Construction activities associated with the Project will take place within a total workspace area of 15.57 acres, consisting primarily of previously disturbed areas (agricultural fields, existing pipeline ROW, residential lawn, industrial uses).

Impacts to wetlands have been avoided and minimized, as possible, and limited tree clearing required to safely and efficiently execute the Project has been minimized to the extent practicable. Construction is unlikely to indirectly affect nesting migratory birds in the vicinity, should they be present, given the heavily disturbed nature of the ecosystem and the limited duration of project construction.

After completion of work activities for the Project, the site will be restored to pre-construction site conditions.

In summary, neither the construction nor operation of the Project is likely to have an adverse direct or indirect impact on migratory birds.

4.0 ALTERNATIVES ASSESSMENT

Algonquin's existing G-2 pipeline provides natural gas to multiple end users and is an essential utility infrastructure that provides natural gas service to these facilities. The primary objective of the Project is to replace an approximately 1.91-mile-long section of deteriorated pipeline to maintain reliable firm and contracted gas services to these end-user customers.

4.1 No-Action Alternative

The replacement of this segment of the existing G-2 pipeline system will ensure the continued safe and reliable operation of the natural gas pipeline facility. A "no-action" approach would result in the termination of service to the previously mentioned facilities. Algonquin would be required to remove this pipeline from service to comply with USDOT regulations. Based on existing and continued energy demands, existing federal safety regulations, the needs for continued natural gas in the current service area, and environmental considerations, a "no-action" alternative is not feasible.

4.2 Alternatives Discussion

Two construction alternatives that could be used to replace the pipeline within the Sakonnet River and Cotton Swamp areas were evaluated.

Alternative #1

The first alternative evaluated was to excavate the sections of pipeline across the Sakonnet River and through Cotton Swamp, then cut out and replace the segments of the pipeline that require repair. This option would require in-water work and increased in-wetland work and disturbance. This potential alterative was not pursued due to the potential for increased environmental impacts.

Alternative #2 (Proposed Project)

The preferred alternative is to install a replacement segment of pipeline primarily within the existing pipeline ROW easement using HDD. This option would allow the replacement segments of pipeline to be installed beneath the bed of the Sakonnet River and beneath Cotton Swamp with surface disturbance only at the entry and exit points, greatly reducing environmental impacts as compared to the open excavation method through these sensitive resources. Algonquin evaluated the possibility of removing the abandoned segments of pipeline under the Sakonnet River and Cotton Swamp. Since Algonquin would need to excavate within these resources in order to remove the existing pipeline, removing the abandoned pipeline segments would result in unnecessary increased environmental impacts. Both segments of the abandoned pipeline have adequate depth of cover and no portions of the existing pipeline are exposed, therefore, the least environmentally impactful option is to grout the replaced pipeline segments and abandon in place. The segments of abandoned pipe will have no impact on the surrounding environment or vessel/boat traffic in the Sakonnet River.

The limited open cut installation west of Cotton Swamp to M&R 00013 has been designed to minimize and avoid temporary wetland impacts to the extent possible, only resulting in approximately 2,400 square feet (0.06 acres) of total temporary wetland impacts. Alternative #2,

the preferred alternative and proposed Project scope, is the least impactful option to execute the required maintenance Project.

5.0 HISTORIC AND ARCHAEOLOGICAL RESOURCES

The Project includes excavation activities primarily within and immediately adjacent to the existing, previously disturbed, maintained ROW. Algonquin's cultural resource consultant, The Public Archaeology Laboratory, Inc. (PAL), conducted an archaeological assessment and Phase I survey of the Project area in May, 2022. PAL recommended that construction mats be used for the workspace area in Little Compton, which Algonquin has agreed to. Based on this assessment, PAL concluded that the Project will not affect historic properties and recommended that no further archaeological investigations are required.

On July 21, 2023, PAL submitted the Project cultural assessment to the Rhode Island State Historic Preservation Office (RI SHPO), as well as the Narragansett Indian Tribe, Mashpee Wampanoag Tribe and the Wampanoag Tribe of Gay Head, for review and concurrence. On August 18, 2023, RI SHPO concurred with PAL's conclusion that the Project will not affect historical properties and no additional historical architectural survey is required. A copy of correspondence is provided in Attachment G.

6.0 RHODE ISLAND STANDARDS APPLICABLE TO PROJECTS WITH FRESHWATER WETLANDS IN THE VICINITY OF THE COAST

Rhode Island applies standards to regulated projects and activities in accordance with 650-RICR-20-10-9.7 with the intent to protect and enhance the functions and values of freshwater wetlands, buffers, floodplains, areas subject to flooding, and areas subject to storm flowage. The following section identifies these standards and demonstrates how the Project will comply with these standards.

§ 9.7.1(A) General freshwater wetland protection standards: *All projects and activities subject to this Part shall be designed and carried out to avoid alteration of freshwater wetlands.*

There will be no permanent freshwater wetland impacts or permanent wetland cover type changes as a result of the Project. The Project has been designed to avoid and minimize temporary freshwater wetland impacts to the extent practicable by using HDD to avoid and minimize temporary wetland impacts. Construction mats will be utilized in all workspaces that overlap with freshwater wetlands, reducing the amount of ground disturbance within the freshwater wetlands. Erosion and sediment controls will be installed prior to ground disturbance activities and will be maintained throughout the duration of the Project. Vegetation removal will be confined to the minimum space required to safely and efficiently execute the Project, and stumps will be left in place outside of the direct excavation area to promote rapid revegetation of existing species composition (unless safety or access considerations require stump removal elsewhere). Following the completion of the Project, all wetland areas will be restored to pre-construction conditions, including restoring pre-construction grades and drainage patterns to original configuration, and allowed to revegetate to pre-construction cover type. Additionally, Algonquin will have an Environmental Inspector frequently inspecting the Project workspace to ensure all best management practices are being utilized and maintained throughout construction activities. Following the restoration of the workspace, periodic inspections will be completed to document the status of the freshwater wetland restoration. Therefore, by designing the Project to avoid permanent impacts, utilizing the HDD method, using construction mats, installation and maintenance of erosion and sediment controls, and the restoration of pre-construction conditions, there will be no permanent alteration of freshwater wetlands as a result of the Project.

§ 9.7.1(B)(3) Freshwater wetland buffer standard: *Protection of existing freshwater wetland buffers. All projects and activities shall be designed and carried out to avoid alteration of buffers within buffer zones, except as provided for in § 9.7.1(B)(5) of this Part below. The buffer within a designated buffer zone shall consist of: a) all undeveloped vegetated land; and b) any area to be newly created to resemble buffer pursuant to 9.7.1(b)(4) of this Part, below.*

There will be no permanent buffer impacts or permanent cover type changes to buffers as a result of the Project. The only permanent impacts associated with the Project are at the new aboveground facility (trap site) in Little Compton, which has been specifically located greater than 200 feet from the edge of the Sakonnet River outside the river buffer for the Sakonnet River. Following the completion of the Project, temporarily impacted buffers will be restored and revert back to pre-construction conditions and there will be no change in permanent cover type within buffers.

§ 9.7.1(B)(4) Freshwater wetland buffer standard: *Creation of new buffer on existing disturbed property. When a project or activity is proposed within a buffer zone that does not consist entirely of undeveloped vegetated land, new buffer area may be required to be created within a portion of the buffer zone to resemble a naturally occurring vegetated area. b) A project or activity that cannot, due to site constraints, avoid intrusion into the buffer zone shall be designed and carried out to avoid alteration of the existing buffer as well as meet the following minimum targets for creation of new buffer contiguous to freshwater wetland or existing buffer on the subject property: 1) For single-family houses and other development proposed on property with no existing buildings, the minimum target for total buffer width (existing undeveloped vegetated land plus created buffer) is: (AA)Fifty percent (50%) of the applicable buffer zone width from § 9.23 of this Part, not to exceed fifty feet (50'), on lots greater than or equal to one (1) acre, or (BB)Fifteen feet (15'), on lots less than one (1) acre. 2)For proposed projects or activities on property that is greater than or equal to three (3) acres, that is not a single-family residential lot of record, that contains one (1) or more existing structures, and where the proposed land disturbance total is greater or equal to ten thousand (10,000) square feet, the minimum target for total buffer width is: (AA)Twenty five feet (25') in the non-urban River Protection Regions 1 and 2 (See § 9.24 of this Part); or (BB)Fifteen feet (15') in the urban region (See § 9.24 of this* Part). c*) Creation of new buffer may be accomplished by the planting of vegetation or by allowing the area to naturally revegetate, at the discretion of the CRMC. The CRMC may require plantings as a condition of a permit, and such area shall be defined as buffer. When creating buffer, the CRMC may allow certain areas to remain clear in order to accommodate existing utilities, drainage easements, reasonable access to existing developed shoreline features, property accessories, or conditions where re-vegetation would require the removal or threaten the integrity of existing structures.*

Since buffers temporarily impacted by the Project will be allowed to naturally revegetate to pre-construction conditions, the creation of new buffers is not applicable to the Project.

§ 9.7.1(B)(5) Freshwater wetland buffer standard: *Residential infill lot standard a) This standard shall apply to proposed new construction on an individual residential lot of record, as of the effective date of these Rules, where the lot meets the following conditions:(1)Has frontage on an existing road;(2)Has adjacent lots on both sides that are developed;(3)Is less than or equal to one (1) acre in size; and(4)Is undeveloped vegetated land.*

The Project does not include new construction on an individual residential lot, therefore this standard is not applicable to the Project.

§ 9.7.1(B)(6) Freshwater wetland buffer standard: *Buffer management and maintenance: A buffer shall be retained in a natural vegetative, undisturbed condition to protect the functions and values of the freshwater wetlands and buffer. Certain activities related to buffer management may be authorized as exempt activities pursuant to the provisions and conditions in § 9.6 of this Part.*

Buffers temporarily impacted by the Project will be allowed to naturally vegetate to pre-construction conditions therefore retaining the functions and values of the freshwater wetlands and associated buffers.

§ 9.7.1(C): Setback Standards: *1. Setback standards for primary structures. Primary structures (e.g., residential dwellings, commercial/industrial structures, schools, churches, etc.) must be located to meet a setback distance of no less than the buffer width plus twenty feet (20'). Accessory structures must be located to meet a setback distance of no less than the buffer width plus five feet (5'). 2.Setbacks for onsite wastewater treatment systems: The setback requirements for the components of an onsite wastewater treatment system are specified in the DEM's Rules Establishing Minimum Standards Relating to the Location, Design, Construction and Maintenance of Onsite Wastewater Treatment Systems, 250-RICR-150-10-6, in effect at the time of application. A leach field and the required ten foot (10') cleared zone around it shall be located outside of the buffer.*

The Project does not propose primary structures or wastewater treatment systems; therefore, this standard is not applicable to the Project.

§ 9.7.1(D): Rare or Endangered Species Standard: *No project or activity may result in degradation of the natural characteristics of any rare freshwater wetland type; likewise, no project or activity may reduce the ability of a freshwater wetland or buffer to ensure the long-term viability of any rare or endangered animal or plant species incorporated by reference in §§ 9.3(A) and (B) of this Part or under the Federal Endangered Species Act.*

The Project will not result in permanent wetland impacts and freshwater wetland cover types will revert to pre-construction vegetation cover types. Based on the RIDEM OWR wetland type inventor, the freshwater wetland types temporarily impacted by the Project (EMA, SSA, and FOB) are not considered rare freshwater wetlands types in Rhode Island (RIDEM, 2021 and RIDEM 2023). Therefore, the Project will not result in the degradation of natural characteristics of rare freshwater wetland type. Additionally, since wetland impacts will be temporary in nature, the Project will not reduce the overall long-term ability of the freshwater wetlands or buffers to ensure long-term viability of rare or endangered animal or plant species. State and federal protected animal and plant species are evaluated in Section 3.

§ 9.7.1(E): Flood Protection Standard: *1. Flood storage capacity: Projects and activities taking place in a floodplain shall not result in any net reduction in flood storage capacity and shall not reduce the rate at which floodwater is stored by the floodplain. 2. Floodway obstruction: Projects and activities taking place within or adjacent to rivers or streams shall not encroach into floodway limits with any fill, structure or other development.*

The Project is not located in special flood hazard areas (Zone A, AE, etc.). Although a section of the Cotton Swamp is within the 500-year flood zone (Zone X), which is not considered a special flood hazard area, there will be no grade changes or fill proposed in or adjacent to this area. Additionally, no floodways will be filled as part of the project. The Project will not result in a net reduction in flood storage capacity and will not reduce the rate at which floodwater is stored by the floodplain.

§ 9.7.1(F)Surface Water and Groundwater Diversion Standard: *Projects and activities shall not adversely affect the flow of groundwater or surface water into or out of any freshwater wetland and shall not result in obstruction of, or the reduction in storage capacity of, any area subject to flooding or area subject to storm flowage.*

Since the Project workspace will be restored to pre-construction conditions following the completion of the Project, there will be no adverse effects to the flow of groundwater or surface waters into or out of freshwater wetlands. Minor grading will take place in order to safely install the new aboveground facility in Little Compton, but since this minor alteration is located outside the 200-foot contiguous area associated with the Sakonnet River, these minor changes will have no impact on the flow of groundwater or surface water, nor result in the obstruction of, or the reduction in storage capacity of areas subject to flooding or areas subject to storm flowage.

§ 9.7.1(G):Stormwater Management Standard: *Projects and activities shall meet the minimum standards in the Stormwater Management, Design, and Installation Rules, 250-RICR-150-10-8, or for single-family lots of record the "RI Stormwater Management Guidance for Individual Single Family Residential Lot Development" for the recommended and primary means to achieve this standard.*

The Project has been designed to comply with the minimum standards found in 250-RICR-150-10-8.

§ 9.7.1(H):Erosion and Sedimentation Control Standard: *Projects and activities shall be designed and carried out in a manner that prevents soil erosion and sedimentation consistent with the Stormwater Management, Design and Installation Rules, § 250-RICR-150-10-8.16.*

The Project will be executed in compliance with Algonquin's E&SCP, as discussed in Section 1.4.3 and included in Attachment C, which is consistent with 250-RICR-150-10-8.16. Additionally, Algonquin will permit discharges from construction activities in compliance with state and federal requirements, as applicable.

§ 9.7.1(I): Water Quality Standard: *Projects shall not cause or contribute to a violation of any State water quality standard for surface water or groundwater or contribute to significant degradation of surface water or groundwater resources.*

Pursuant to the 250-RICR-150-05-1 Water Quality Regulations, effective February 26, 2020, the Sakonnet River is classified as a Class SA (seawater) waterbody and is suitable for shellfish harvesting for direct human consumption, primary and secondary contact recreational activities, fish and wildlife habitat, and has good aesthetic value. The Project is avoiding impacts to the Sakonnet River through the use of the HDD. Impacts to Cotton Swamp and associated streams will be avoided and minimized to the extent practicable by the use of the HDD. Temporary impacts associated with the Project will be minimized by utilizing Algonquin's E&SC Plan and SPCC Plan. Additionally, Algonquin has a BDP Plan prepared for the Project (see Attachment D).

7.0 RHODE ISLAND STANDARDS APPLICABLE TO PROJECTS IN TIDAL AND COASTAL POND WATERS ON SHORELINE FEATURES AND THEIR CONTIGUOUS AREAS

Rhode Island applies standards to regulated projects and activities pursuant to the federal Coastal Zone Management Act and RI General Laws Chapter 46-23 with 650-RICR-20-00-1. The purpose of these rules is to manage the coastal resources of the state, provide for the integration and coordination of the protection of natural resources, promote reasonable coastal-dependent economic growth, and improve protection of life and property from coastal hazards. The following section identifies the standards in these regulations and demonstrates how the Project will comply with these standards.

1.2.1B, 1.2.1C Type 1 and Type 2 Conservation Areas: *Sakonnet River is Type 1 along coast, Type 2 in open water (CRMC, 2010a and CRMC, 2010b). CRMC's goal for Type 1 waters is to preserve and protect them from activities and uses that have the potential to degrade scenic, wildlife, and plant habitat values, or which may adversely impact water quality or natural shoreline types. CRMC's goal for Type 2 waters is to maintain and, where possible, restore the high scenic value, water quality, and natural habitat values of these areas, while providing for low intensity uses that will not detract from these values.*

By utilizing the HDD methodology, the Project proposes to replace the pipeline without altering the characteristics of the shoreline and tidal waters in the vicinity of the Project. While the HDD method is a proven technology, there are certain temporary impacts that could occur as a result of the drilling such as the inadvertent release of drilling fluid. Accordingly, Algonquin has developed a Best Drilling Practices Plan & Monitoring and Clean-up of Horizontal Directional Drilling Inadvertent Returns (BDP Plan) for monitoring the HDD program for the Project (see Attachment D). This BDP Plan will be kept on-site and will be available and implemented by all proposed personnel described in the BDP Plan.

1.2.2.E Rocky Shores: *CRMC's goal is to preserve and protect rocky shores for their role in erosion prevention, for the unique assemblages of organisms that they may support, and for their recreation and scenic value.*

By utilizing the HDD methodology, the Project will not impact the Sakonnet River's rocky shores. The proposed TWS near the Sakonnet River is located on an active agricultural field and will not impact the rocky shores associated with the Sakonnet River. Algonquin will install and maintain erosion and sediment controls in accordance with Algonquin's E&SCP to avoid and minimize runoff during construction, and the entire area will be restored and stabilized upon completion of the Project.

1.2.3 Areas of Historic and Archaeological Significance: *CRMC's goal is to, where possible, preserve and protect significant historic and archaeological properties in the coastal zone.*

As identified in Section 5.0, on July 21, 2023, PAL submitted the Project cultural assessment to the RI SHPO, as well as the Narragansett Indian Tribe, Mashpee Wampanoag Tribe and the Wampanoag Tribe of Gay Head, for review and concurrence. On August 18, 2023, RI SHPO concurred with PAL's conclusion that the Project will not affect historical properties and no additional historical architectural survey is required. A copy of correspondence is provided in Attachment G.

1.3.1.H.2.a(1-2) Energy-related Activities and Structures: *CRMC requires a permit for construction, alteration, and operation for facilities that transfer petroleum products sited within the coastal region due to the high probability of affecting coastal resources and land uses.*

1.3.1.H.2.a(3) The siting, construction, alteration and/or operation of petroleum processing, transfer or storage facilities and power generating facilities within the State of Rhode Island shall require a Council permit when there is reasonable probability demonstrated by reliable and probative evidence that the proposal will: (AA) Conflict with any Council management plan or program, (BB) Make any area unsuitable for any uses or activities to which it is allocated by a Council Plan or Program, or (CC) Significantly damage the environment of the coastal region.

One CRMC management plan exists for areas within the vicinity of the Project. The CRMC Shoreline Change Special Area Management Plan is applicable to the 420 miles of shoreline in RI (CRMC, 2018). The Project will drill beneath the shoreline in Little Compton and Portsmouth, therefore avoiding conflict with this management plan. The area will remain suitable for uses and activities allocated by the plan, and the Project will not significantly damage the environment of the coastal region.

1.3.1.H.2.a(4) Applicants for energy facilities must consider the projected impacts of climate change, including but not limited to projected storm surge, coastal erosion and sea level rise to these facilities.

Algonquin considered the projected impacts of climate change when engineering the replacement pipeline and aboveground facility. For the majority of the Project, the replacement pipeline will be installed below the surface, with sufficient cover to prevent erosive forces from exposing the pipe. The new aboveground facility proposed in Little Compton is sited approximately 34 feet above sea level, and the existing M&R00013 station in Portsmouth is sited approximately 69 feet above sea level, significantly above the NOAA worst-case sea level rise scenario of eight feet by year 2100 (NOAA 2017). The largest storm surge on record in Rhode Island was during the 1938 Hurricane, which was approximately 9.5 feet above normal high tide in Newport County and approximately 13.5 feet higher than normal high tide in Providence County. The proposed aboveground facility and the existing M&R Station are sited at higher elevations than the highest record storm surge on top of the worst-case scenario sea level rise.

1.3.1.H.2.a(5) Applicants shall be further required to demonstrate by reliable and probative evidence that:(AA) Alternative sites have been considered and rejected for environmental, economic and/or operational reasons.

As identified in Section 4.0, Algonquin has considered alternatives that were rejected for environmental, economic and/or operational reasons.

(BB) Construction and/or operation will be in conformance with all applicable environmental standards, guidelines and objectives.

Prior to starting construction of the Project, Algonquin will obtain the necessary state and federal permits required to authorize the Project.

(CC) Siting will not cause secondary developments that are inconsistent with the State Guide Plan or approved municipal comprehensive plans.

This maintenance Project is required to improve the reliability and safety of Algonquin's existing pipeline. No additional development is necessary to make the Project viable. The Project will not cause secondary developments that are inconsistent with the State Guide Plan or approved municipal comprehensive plans.

(DD) Operation will not degrade aquifers or water bodies utilized for public water supply

The Project is located on aquifers classified as GA, suitable for drinking. By utilizing the E&SCP, SPCC Plan and BDP Plan, construction and operation of the Project will not degrade aquifers or waterbodies utilized for public water supply.

(EE) Adequate procedures for the safe transport and/or disposal of products, materials and/or wastes hazardous to man or the coastal environment will be taken, including emergency containment and cleanup.

The Project will be completed in compliance with Algonquin's E&SC Plan, SPCC Plan and BDP Plan to ensure the safe transport and/or disposal of products, materials and/or wastes hazardous to man or the coastal environment. Additionally, to facilitate proper disposal, soil and groundwater pre-characterization will be completed prior to starting construction.

1.3.1.H.2.a(7) Recipients of approved Council permits shall be required to maintain such records as may be necessary to monitor and ensure compliance of facility operations with all applicable Policies as set forth above.

Algonquin will maintain such records as may be necessary to monitor and ensure compliance of facility operations with all applicable Policies as set forth above.

1.3.1.H.3 Certified verification agent (CVA) requirement for energy-related activities defined in § 1.1.2 of this Part for which the CRMC has jurisdiction or requires a permit in accordance with §§ 1.1.4 and 1.3.3 of this Part, and as required by the CRMC executive director to review projects that are outside the scope of CRMC staff expertise.

If required, Algonquin will retain and utilize a CVA as required in *1.3.1.H.3.b-q*.

1.3.1.H.4 Applicants must demonstrate that all relevant local zoning ordinances, building codes, flood hazard standards, and all state safety codes, fire codes, and environmental requirements have or will be met.

The Project proposes the replacement of an existing pipeline located primarily within the existing ROW. No changes to zoning are required to complete the Project and no building codes or flood hazard standards apply. As applicable, state safety codes, fire codes and environmental requirements will be met.

1.3.1.H.5 Industrial operations and structures are prohibited in Type 1 and 2 waters or on shoreline features and their contiguous areas abutting these waters.

The Project does not propose industrial operations or structures in Type 1 or 2 waters or their 200-foot contiguous areas. The Pipeline will run approximately 210 feet below the bed of the Sakonnet River, avoiding impacts to the shore and there will be no proposed permanent changes to land use within the jurisdictional area following final site restoration. The aboveground facility in Little Compton will be located greater than 200 feet from the banks of the Sakonnet River.

1.3.1.H.6.a Unless preempted under the regulations of the Federal Energy Regulatory Commission the following summary defines the scope of the topics that shall be addressed by applicants for power generating and petroleum processing and storage as they apply to construction, operation, decommissioning, and waste disposal:

(1) Environmental impacts,

Section 2.0 and Section 3.0 identify the Project's temporary environmental impacts.

(2) Social impacts,

In order to continue Algonquin's commitment to safety and reliability, it is critical that Algonquin maintain the existing G-2 pipeline system through Portsmouth and Little Compton. The construction duration is temporary and will result in a minimal negative social impact to the surrounding community when compared to the long-term, lasting positive social impact the Project will have on the overall community.

(3) Economic impacts,

See Section 1.0 for Project's economic impact.

(4) Alternative sites,

See Section 4.0 above for Alternatives Assessment.

(5) Alternative means to fulfill the need for the facility,

See Section 4.0 above for Alternatives Assessment.

(6) Demonstration of need, and

See Section 1.0 for a description of Project need.

(7) Consistency with state and national energy policies.

See Section 1.0 for a description of Project need.

1.3.1.H.7.a Filling, removing, or grading

The Project does not propose filing, removing, or grading of beaches, rocky shores, or within coastal wetlands. Open cut replacement of the pipeline will temporarily impact approximately 2,400 square feet (0.06 acres) of freshwater wetlands via excavation, below the threshold in the standard 1.3.1.B.f for activities to be reviewed at the Category B level.

1.3.1.H.7.b Residential, commercial, industrial, and public recreational structures

As discussed in the response to *1.3.1.H.2.a(3)* above, the Project will not negatively impact any public access plan, nor will it threaten lives or coastal resources in the event of a storm disaster.

1.3.1.H.7.c Treatment of sewage and stormwater

No sewage or stormwater treatment facilities are proposed as part of this Project.

1.3.1.H.8.b(2) Applicants for such a permit shall demonstrate by a fair preponderance of evidence that the proposed action will not: (AA) Conflict with any Council management plan or program;

See response to *1.3.1.H.2.a(3)* above.

(BB) Make any area unsuitable for any uses or activities to which it is allocated by a Council management plan or program, or

The Project does not propose substantial changes to the landscape. A small trap facility will be constructed in Little Compton, resulting in minor reductions to privately owned land. The Project will not make the area unsuitable for current or potential future use.

(CC) Significantly damage the environment of the coastal region.

The Project will implement the E&SC Plan, SPCC Plan and BDP Plan, which have all been designed to minimize and avoid impacts to the surrounding environment. Through the use of these construction plans, as well as the short-term construction duration of the Project, there will be no significant damage to the environment of the coastal region as a result of the Project.

1.3.1.H.8.b(3) In addition to those requirements set forth in § 1.3.1(H)(2) of this Part, it shall be further demonstrated by reliable and probative evidence that the coastal resources are capable of supporting the proposed activity including the impacts and/or effects related to:

(AA)Scheduling and duration of construction relative to recreational, wildlife and fisheries use of affected areas;

By utilizing the HDD method, the Project will not affect recreational, wildlife or fisheries use of the Sakonnet River. To the extent practicable, Algonquin will expedite the HDD under the Sakonnet River while executing the Project safely and efficiently.

(BB) The degree and nature, if any, of site reclamation proposed; and

Following the completion of the Project, all TWS will be fully restored to preconstruction conditions. Routine monitoring will occur until restoration is complete and the site is fully stabilized. See response to 9.7.1(A) in Section 6 above for more details on site reclamation.

(CC) Exposure of the proposed pipelines to hazardous bottom conditions.

The replacement pipe will be installed up to approximately 210 feet below the Sakonnet River riverbed; therefore, the replacement pipe will be adequately protected against hazardous bottom conditions.

1.3.5.B. Visual requirements of projects in and adjacent to Type 1, 2, and 4 waters

By utilizing the HDD method, the existing vegetation along the banks of the Sakonnet River will be maintained and the Project will not impact the rocky shoreline. The new aboveground facility is located greater than 200 feet from the banks of the Sakonnet River and will be visually insignificant compared to the surrounding landscape.

1.3.6 Protection and Enhancement of Public Access to the Shore

The replacement pipeline will be installed below the Sakonnet River and associated banks, therefore the Project will not interfere with the public's right to pass and repass along the shore.

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Attachment A
Figures

ENBRIDGE
ALGONQUIN GAS TRANSMISSION, LLC

G-2 NATURAL GAS PIPELINE MAINTENANCE PROJECT

USGS TOPOGRAPHIC MAP

TIVERTON QUADRANGLE
PORTSMOUTH AND LITTLE COMPTON, RI

- Meter and Regulation Station 00013
- Pipeline
- Project Area

SWCA
ENVIRONMENTAL CONSULTANTS

1:24,000
Created By: S. McKinney
Project Number: 68136
Date: 8/31/2023
NAD 1983 2011 StatePlane Rhode Island FIPS 3800 Ft US

0 1,000 2,000 Feet
0 250 500 Meters

ENBRIDGE
ALGONQUIN GAS TRANSMISSION, LLC

G-2 NATURAL GAS PIPELINE MAINTENANCE PROJECT

NATURAL RESOURCE MAP EAST BANK

TIVERTON QUADRANGLE
LITTLE COMPTON, RI

- Pipeline
- River 200 Foot Contiguous Area
- Project Area
- Municipal Boundary

SWCA
ENVIRONMENTAL CONSULTANTS

1:3,600

Created By: S. McKinney
Project Number: 68136
Date: 9/14/2023
NAD 1983 2011 StatePlane Rhode Island FIPS 3800 Ft US

0 100 200 Feet
0 25 50 Meters

ENBRIDGE
ALGONQUIN GAS TRANSMISSION, LLC

G-2 NATURAL GAS PIPELINE MAINTENANCE PROJECT

NATURAL RESOURCE MAP EAST BANK

TIVERTON QUADRANGLE
LITTLE COMPTON, RI

- Pipeline
- Delineated Wetland Area
- Wetland 100 Foot Contiguous Area
- Buffer Zone (50 feet)
- Project Area
- Municipal Boundary

SWCA
ENVIRONMENTAL CONSULTANTS

Page: 2 of 2

1:3,600

Created By: S. McKinney
Project Number: 68136
Date: 9/14/2023
NAD 1983 2011 StatePlane Rhode Island FIPS 3800 Ft US

0 100 200 Feet

0 25 50 Meters

ENBRIDGE
ALGONQUIN GAS TRANSMISSION, LLC

G-2 NATURAL GAS PIPELINE MAINTENANCE PROJECT

NATURAL RESOURCE MAP
WEST BANK

TIVERTON QUADRANGLE
PORTSMOUTH, RI

- Meter and Regulation Station 00013
- Pipeline
- Surface Flow; Ditch
- Delineated Wetland Area
- Buffer: undeveloped, undisturbed vegetation within Buffer Zone
- Buffer Zone (50 feet)
- Wetland 100 Foot Contiguous Area
- Municipal Boundary
- Temporary Workspace
- Pipeline Right-of-Way

SWCA
ENVIRONMENTAL CONSULTANTS

1:2,400

Created By: S. McKinney
Project Number: 68136
Date: 10/16/2023
NAD 1983 2011 StatePlane Rhode Island FIPS 3800 Ft US

0 100 200 Feet
0 25 50 Meters

ENBRIDGE
ALGONQUIN GAS TRANSMISSION, LLC

G-2 NATURAL GAS PIPELINE MAINTENANCE PROJECT

NATURAL RESOURCE MAP WEST BANK

TIVERTON QUADRANGLE
PORTSMOUTH, RI

- Pipeline
- Surface Flow; Ditch
- Stream Area
- Delineated Wetland Area
- Buffer: undeveloped, undisturbed vegetation within Buffer Zone
- Buffer Zone (50 feet)
- Stream 100 Foot Contiguous Area
- Wetland 100 Foot Contiguous Area
- Municipal Boundary
- Temporary Workspace
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SWCA
ENVIRONMENTAL CONSULTANTS

1:2,400

Created By: S. McKinney
Project Number: 68136
Date: 10/16/2023
NAD 1983 2011 StatePlane Rhode Island FIPS 3800 Ft US

0 100 200 Feet
0 25 50 Meters

Attachment B
Project Drawings

CONSTRUCTION SCOPE OF WORK

CIVIL

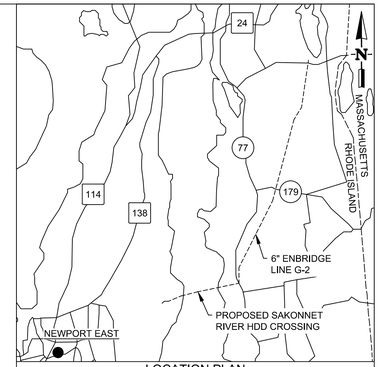
- C1 INSTALL SECURITY FENCE
- C2 CONSTRUCT A LEVEL PLATFORM / GRAVEL WORKING AREA
- C3 EXTEND GRAVEL ACCESS ROAD
- C4 RESTORE ORIGINAL CONDITION AND RE-GRADE SITE

STRUCTURAL

- S1 REMOVE EXISTING SUPPORTS
- S2 INSTALL PROPOSED SUPPORTS

MECHANICAL

- M1 INSTALL PROPOSED 12" G-2 PIPING VIA HDD (UNDER SAKONNET RIVER, APPROX. 7339' PLAN VIEW LENGTH).
- M2 INSTALL 12"X16" SENDING TRAP AND 6"X10" RECEIVING TRAP ON EAST SIDE OF SAKONNET RIVER.
- M3 INSTALL 12" G-2 PIPING VIA OPEN TRENCH IN EXISTING ROW BETWEEN WETLAND HDD AND PORTSMOUTH M&R STATION.
- M4 INSTALL 12"X16" RECEIVING TRAP AT PORTSMOUTH M&R STATION.
- M5 ABANDON EXISTING LINE G-2 PIPELINE BETWEEN THE PORTSMOUTH M&R STATION AND THE NEW TRAP ON THE EAST (LITTLE COMPTON) SIDE WHEN THE EXISTING PORTSMOUTH RECEIVING TRAP OUTAGE IS COMPLETE (APPROX. 9978' PLAN VIEW LENGTH).
- M6 INSTALL PROPOSED 12" G-2 PIPING VIA HDD (UNDER WETLAND AREA, APPROX. 1310' PLAN VIEW LENGTH).
- M7 REMOVE EXISTING, 6" PIPING FROM SERVICE (ABOVE GROUND), CAP AND GROUT PIPELINE IN-PLACE (BELOW GROUND).
- M8 INSTALL 12" G-2 PIPING VIA OPEN TRENCH BETWEEN SAKONNET RIVER HDD ENTRY POINT AND WETLAND HDD EXIT POINT.



LOCATION PLAN

PORTSMOUTH & LITTLE COMPTON,
NEWPORT COUNTY, RHODE ISLAND

LITTLE COMPTON

SAKONNET RIVER

PORTSMOUTH

SEE XXX-C.501-XXX4 FOR EAST SIDE PLAN

SEE XXX-C.501-XXX5 FOR DETAILED PLAN - EAST SIDE

ENBRIDGE LINE G-2

C1 C2 C3

M2 M7

BORING SAK-E-1
N 162634.73
E 408222.3000
LAT N041.529310
LONG W071.207321

7339' +/-

M1

PROPOSED HDD ALIGNMENT (RIVER CROSSING)

BORING SAK-R-E-2
N 162109.71
E 406075.7024
LAT N041.527889
LONG W071.215167

BORING SAK-R-E-1
N 162321.82
E 407074.1679
LAT N041.528462
LONG W071.211518

SEE XXXX-C.501-XXX3 FOR WEST SIDE PLAN

SEE XXXX-C.501-XXX2 FOR DETAILED WEST SIDE PLAN

BORING SAK-W-2
N 161342.99
E 401719.7400
LAT N041.525823
LONG W071.231084

BORING SAK-W-1
N 161383.62
E 402097.0620
LAT N041.525931
LONG W071.229705

BORING SAK-R-W-2
N 161484.40
E 403136.0271
LAT N041.526199
LONG W071.225910

BORING SAK-R-W-1
N 161682.26
E 404051.8944
LAT N041.526734
LONG W071.222563

M7

PORTSMOUTH METERING STATION

M3 M5

M6

PROPOSED HDD ALIGNMENT (WETLAND CROSSING)

BORING SAK-W-3
N 161084.46
E 400901.3600
LAT N041.525121
LONG W071.234075

1310' +/-

C4 M4 M5

M7 E4

BORING SAK-B-1
N 160138.68
E 398920.5965
LAT N041.522542
LONG W071.241319

BORING SAK-B-2
N 160090.64
E 398742.5338
LAT N041.522411
LONG W071.241970

LEGEND

- TEMPORARY WORKSPACE WITHIN THE R.O.W., WORKSPACE IN WETLAND TO BE MATTED
- TEMPORARY WORKSPACE OUTSIDE OF R.O.W, WORKSPACE IN WETLAND TO BE MATTED
- WETLAND AREA
- EXISTING ENBRIDGE LINE G-2
- PROPOSED HDD ALIGNMENTS
- PROPOSED OPEN TRENCH INSTALLATION

REV:	PROJECT TITLE:	SEQ #:
0.H	SAKONNET RIVER HDD	XXX
AFE: MC.400264.073.10.01	PROJ NO: XXXXXX	
WP NO.: XXXX		

REV	REVISION DESCRIPTION	DATE BY	CHK APPR
0.F	ISSUED FOR 90% REVIEW	2023-06-16 BARR/OTC	BARR/AFL O. CANNON
0.G	RE-ISSUED FOR 90% REVIEW	2023-08-31 BARR/PS1	BARR/AFL O. CANNON
0.H	RE-ISSUED FOR 90% REVIEW	2023-09-29 BARR/PS1	BARR/AFL O. CANNON

0 400 800 1200

1" = 400'-0"

DWG. NO.	REFERENCE DWG.	REV	DATE	DSN	CK	DESCRIPTION
		0.G	2023-08-31	PS1	AFL	RE-ISSUED FOR 90% REVIEW
		0.F	2023-06-16	OTC	AFL	ISSUED FOR 90% REVIEW
		0.E	2023-06-12	OTC	AFL	ISSUED FOR PERMITTING
		0.D	2023-04-27	OTC	AFL	RE-ISSUED FOR 60% DESIGN
		0.C	2023-01-20	BNM	OTC	RE-ISSUED FOR 30% REVIEW
		0.B	2022-07-22	AAB	OTC	ISSUED FOR 60% REVIEW

BARR
Corporate Headquarters:
Minneapolis, Minnesota
Ph: 1-800-632-2277

TITLE	INITIALS	DATE
DRAWN BY:	AAB	07-22-2022
DESIGN CHECKER:	AFL	04-27-2023
DESIGN ENGINEER:	OTC	04-27-2023
PROJECT MANAGER:	JJL	04-27-2023

TITLE: CIVIL
PLOT PLAN
OVERALL PLAN

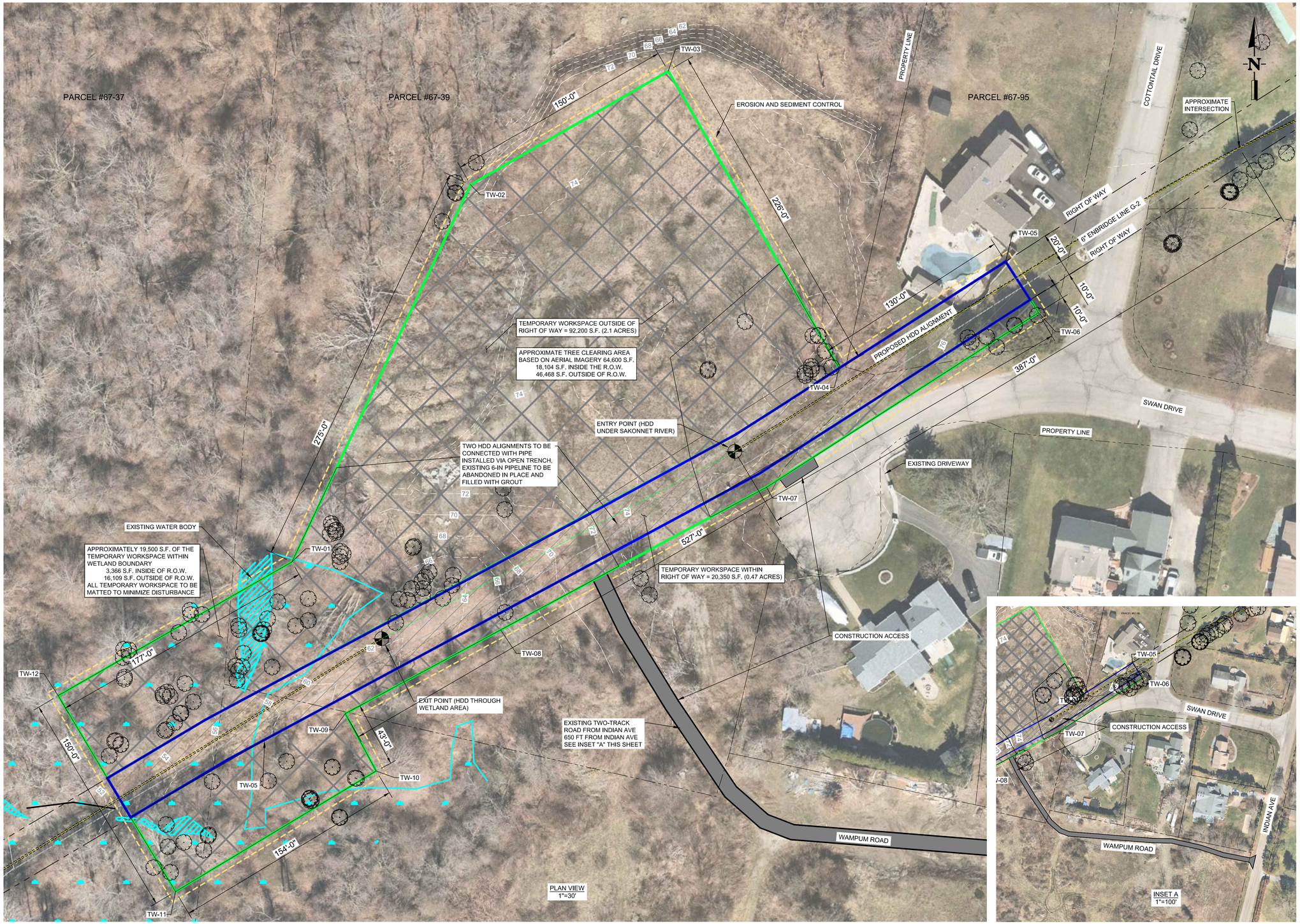
LOC.: NEWPORT COUNTY, RHODE ISLAND

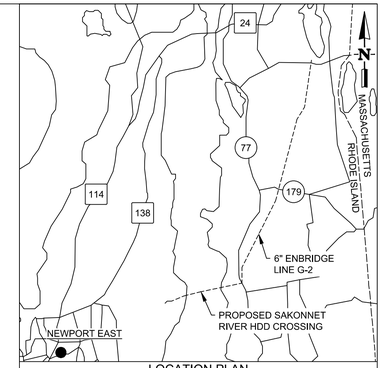
YEAR: 2022 | W.O.: | SCALE: AS SHOWN

ENBRIDGE

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 | 627-5400

DWG.: XXXX-C.501-XXX1 | REV.: 0.H





LOCATION PLAN

PORTSMOUTH & LITTLE COMPTON,
NEWPORT COUNTY, RHODE ISLAND

NOTES:

1. THE ALIGNMENT OF ENBRIDGE PIPELINE G-2 IS APPROXIMATE. FIELD VERIFY ITS LOCATION PRIOR TO WORK .
2. COORDINATES SHOWN ARE BASED ON RHODE ISLAND STATE PLANES COORDINATE SYSTEM. UNITS IN U.S. SURVEY FOOT.

LEGEND

- TEMPORARY WORKSPACE WITHIN THE R.O.W., WORKSPACE IN WETLAND TO BE MATTED
- TEMPORARY WORKSPACE OUTSIDE OF THE R.O.W., WORKSPACE IN WETLAND TO BE MATTED
- EXISTING WETLAND AREA
- EXISTING WATER BODY
- TEMPORARY ACCESS ROUTE
- EXISTING 6-IN ENBRIDGE LINE G-2
- PROPOSED HDD ALIGNMENT
- PROPOSED OPEN TRENCH INSTALLATION
- PROPERTY LINE
- EROSION AND SEDIMENT CONTROL
- EXISTING CONTOUR (SHOWN IN WHITE)
- TREES (TREE SURVEY JUNE 7, 2023)

TEMPORARY WORKSPACE POINTS

POINT ID	NORTHING	EASTING	LATITUDE	LONGITUDE
TW-01	160928.38	400760.76	N41.524693	W71.234591
TW-02	161176.55	400878.21	N41.525374	W71.234159
TW-03	161251.31	401008.25	N41.525578	W71.233683
TW-04	161055.88	401120.62	N41.525040	W71.233275
TW-05	161126.07	401230.05	N41.525232	W71.232875
TW-06	161092.40	401251.64	N41.525139	W71.232796
TW-07	160977.68	401072.79	N41.524826	W71.233451
TW-08	160883.63	400898.08	N41.524569	W71.234090
TW-09	160828.58	400795.83	N41.524419	W71.234464
TW-10	160790.84	400816.15	N41.524316	W71.234390
TW-11	160711.48	400684.23	N41.524099	W71.234872
TW-12	160840.43	400607.07	N41.524453	W71.235153

REV:	PROJECT TITLE:	SEQ #:
0.H	SAKONNET RIVER HDD	XXX

AFE: MC.400264.073.10.01 PROJ NO: XXXXXX
WP NO: XXXX

REV	REVISION DESCRIPTION	DATE BY	CHK APPR
0.E	ISSUED FOR PERMITTING	2023-06-12 BARR/OTC	BARR/AFL O. CANNON
0.F	ISSUED FOR 90% REVIEW	2023-06-16 BARR/OTC	BARR/AFL O. CANNON
0.G	RE-ISSUED FOR 90% REVIEW	2023-08-31 BARR/PS1	BARR/AFL O. CANNON
0.H	RE-ISSUED FOR 90% REVIEW	2023-09-29 BARR/PS1	BARR/AFL O. CANNON

0 30 60 90
1" = 30'-0"

0 100 200 300
1" = 100'-0"

DWG. NO.	REFERENCE DWG.	REV	DATE	DSN	CK	DESCRIPTION
		0.G	2023-08-31	PS1	AFL	RE-ISSUED FOR 90% DESIGN
		0.F	2023-06-16	OTC	AFL	ISSUED FOR 90% DESIGN
		0.E	2023-06-12	OTC	AFL	ISSUED FOR PERMITTING
		0.D	2023-04-27	OTC	AFL	RE-ISSUED FOR 60% REVIEW
		0.C	2023-01-20	BNM	OTC	RE-ISSUED FOR 30% REVIEW
		0.B	2022-07-22	PS1	OTC	ISSUED FOR 60% REVIEW

BARR
Corporate Headquarters:
Minneapolis, Minnesota
Ph: 1-800-632-2277

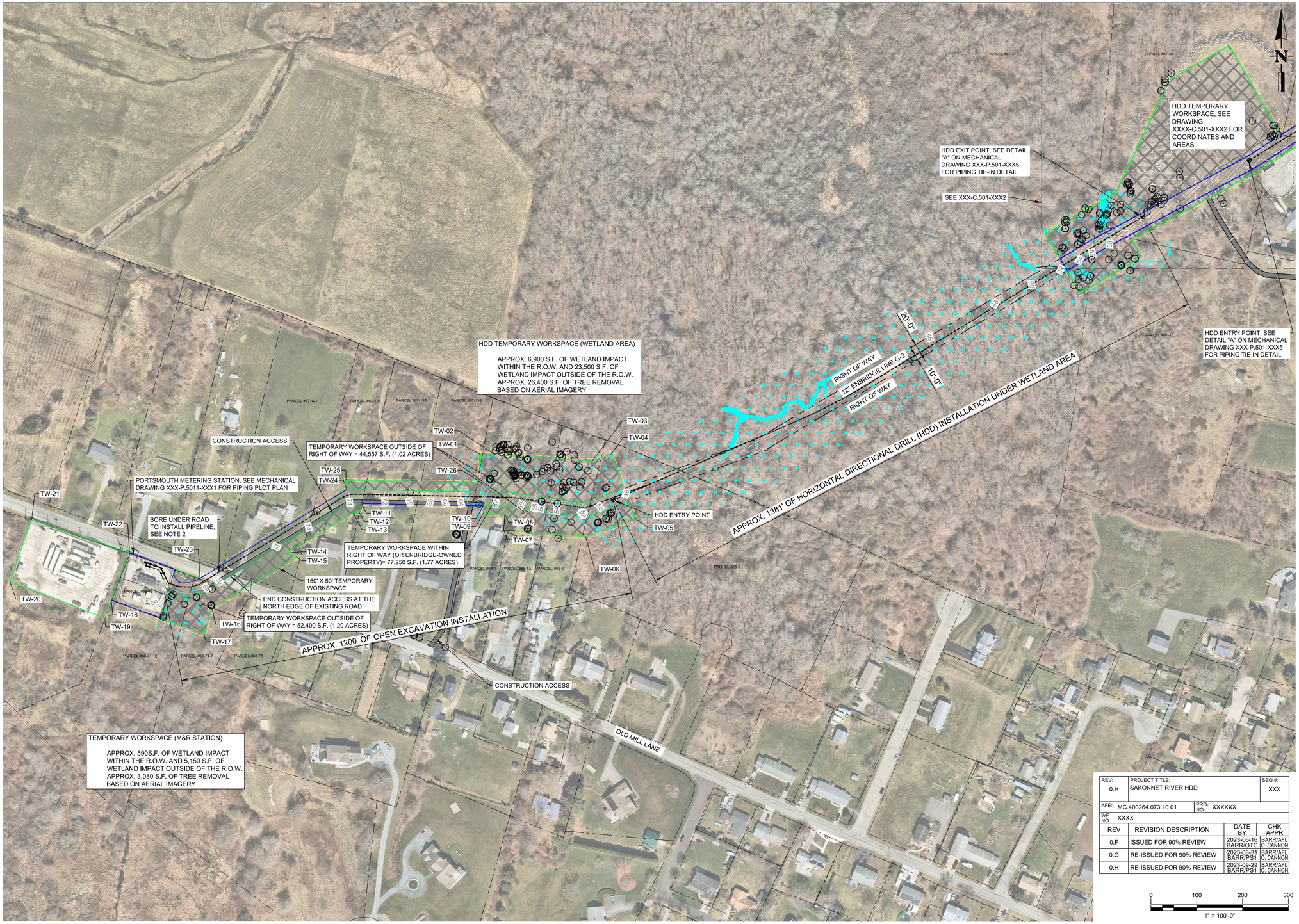
DRAWN BY:	AAB	07-22-2022
DESIGN CHECKER:	AFL	04-21-2023
DESIGN ENGINEER:	OTC	04-27-2023
PROJECT MANAGER:	JJL	

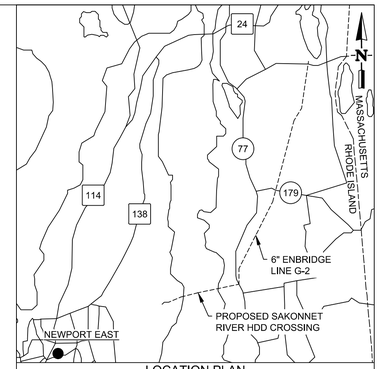
TITLE: CIVIL
TEMPORARY WORKSPACE LAYOUT
WEST SIDE

LOC.: NEWPORT COUNTY, RHODE ISLAND

ENBRIDGE
Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

TITLE	INITIALS	DATE	YEAR:	W.O.:	SCALE:	DWG.:	REV.:
			2022		AS SHOWN	XXXX-C.502-XXX2	0.H





LOCATION PLAN

PORTSMOUTH & LITTLE COMPTON, NEWPORT COUNTY, RHODE ISLAND

NOTES:

1. THE ALIGNMENT OF ENBRIDGE PIPELINE G-2 IS APPROXIMATE. CONTRACTOR TO FIELD VERIFY ITS LOCATION PRIOR TO WORK .
2. BORE UNDER ROAD TO FOLLOW REQUIREMENTS OF ENBRIDGE DESIGN PROCEDURE DP-PX1.2 (ROAD AND RAILROAD CROSSINGS) FOR UNCASED ROAD CROSSINGS. A MINIMUM OF 5FT OF COVER TO BE MAINTAINED UNDER ROAD AND TO EXTEND 3FT BEYOND THE ROAD ROW.

LEGEND

- TEMPORARY WORKSPACE WITHIN THE R.O.W., WORKSPACE IN WETLAND TO BE MATTED
- TEMPORARY WORKSPACE OUTSIDE OF THE R.O.W., WORKSPACE IN WETLAND TO BE MATTED
- WETLAND AREA
- ENBRIDGE LINE G-2
- PROPOSED HDD ALIGNMENT
- OP — OVERHEAD POWER
- BURIED ELECTRICAL (OR UNKNOWN UTL)
- EROSION AND SEDIMENT CONTROL
- 62 — EXISTING CONTOUR (SHOWN IN WHITE)
- TREE (TREE SURVEY COMPLETED JUNE 7, 2023)

TEMPORARY WORKSPACE CORDINATES

POINT ID	NORTHING	EASTING	LATITUDE	LONGITUDE
TW-01	160358.65	399374.72	N41.523141	W71.239658
TW-02	160358.59	399406.59	N41.523141	W71.239542
TW-03	160343.71	399618.20	N41.523098	W71.238769
TW-04	160359.10	399659.46	N41.523140	W71.238619
TW-05	160220.07	399711.34	N41.522758	W71.238431
TW-06	160180.02	399604.00	N41.522649	W71.238823
TW-07	160193.70	399425.35	N41.522688	W71.239475
TW-08	160228.50	399428.15	N41.522784	W71.239465
TW-09	160231.91	399381.81	N41.522794	W71.239634
TW-10	160246.59	399380.99	N41.522834	W71.239637
TW-11	160251.73	399115.39	N41.522850	W71.240607
TW-12	160231.82	399110.77	N41.522796	W71.240624
TW-13	160232.09	399096.84	N41.522796	W71.240675
TW-14	160143.41	398950.27	N41.522554	W71.241211
TW-15	160135.24	398973.14	N41.522532	W71.241127
TW-16	160023.66	398788.48	N41.522227	W71.241803
TW-17	159966.67	398771.19	N41.522071	W71.241867
TW-18	160040.74	398569.01	N41.522276	W71.242604
TW-19	160001.05	398555.22	N41.522167	W71.242655
TW-20	160082.30	398347.87	N41.522391	W71.243411
TW-21	160216.18	398395.51	N41.522759	W71.243236
TW-22	160144.30	398609.08	N41.522559	W71.242457
TW-23	160088.60	398762.83	N41.522405	W71.241896
TW-24	160282.36	399083.34	N41.522934	W71.240723
TW-25	160302.35	399081.72	N41.522989	W71.240729
TW-26	160296.66	399378.19	N41.522971	W71.239646

REV:	PROJECT TITLE:	SEQ #:
0.H	SAKONNET RIVER HDD	XXX

AFE:	MC.400264.073.10.01	PROJ NO:	XXXXXX
WP NO:	XXXX		

REV	REVISION DESCRIPTION	DATE BY	CHK APPR
0.F	ISSUED FOR 90% REVIEW	2023-06-16 BARR/OTC	BARR/AFL O. CANNON
0.G	RE-ISSUED FOR 90% REVIEW	2023-08-31 BARR/PS1	BARR/AFL O. CANNON
0.H	RE-ISSUED FOR 90% REVIEW	2023-09-29 BARR/PS1	BARR/AFL O. CANNON

0 100 200 300

1" = 100'-0"

DWG. NO.	REFERENCE DWG.	REV	DATE	DSN	CK	DESCRIPTION
		0.G	2023-08-31	PS1	AFL	RE-ISSUED FOR 90% REVIEW
		0.F	2023-06-16	OTC	AFL	ISSUED FOR 90% REVIEW
		0.E	2023-06-12	OTC	AFL	ISSUED FOR PERMITTING
		0.D	2023-04-27	OTC	AFL	RE-ISSUED FOR 60% REVIEW
		0.C	2023-01-20	BNM	OTC	RE-ISSUED FOR 30% REVIEW
		0.B	2022-07-22	PS1	OTC	ISSUED FOR 60% REVIEW

BARR
Corporate Headquarters:
Minneapolis, Minnesota
Ph: 1-800-632-2277

DRAWN BY:	AAB	07-22-2022
DESIGN CHECKER:	AFL	04-27-2023
DESIGN ENGINEER:	OTC	04-27-2023
PROJECT MANAGER:	JJL	04-27-2023
TITLE	INITIALS	DATE

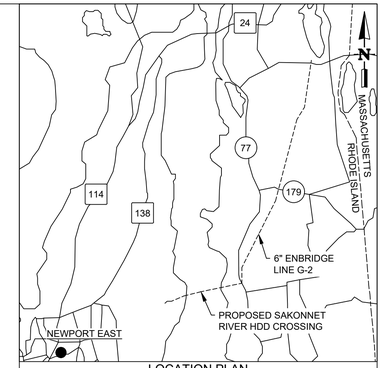
CIVIL
HDD AND OPEN TRENCH PIPELINE INSTALLATION LAYOUT
WEST SIDE
TITLE:

ENBRIDGE

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

LOC.: NEWPORT COUNTY, RHODE ISLAND

YEAR: 2022 | W.O.: | SCALE: AS SHOWN | DWG.: XXXX-C.502-XXX3 | REV.: 0.H



LOCATION PLAN

PORTSMOUTH & LITTLE COMPTON, NEWPORT COUNTY, RHODE ISLAND

NOTES:

1. THE ALIGNMENT OF ENBRIDGE PIPELINE G-2 IS APPROXIMATE. CONTRACTOR TO FIELD VERIFY ITS LOCATION PRIOR TO WORK.

LEGEND

- PROPOSED TEMPORARY WORKSPACE AREA WITHIN RIGHT-OF-WAY
- PROPOSED TEMPORARY WORKSPACE AREA OUTSIDE OF RIGHT-OF-WAY
- EXISTING WETLAND
- ENBRIDGE LINE G-2
- PROPOSED HDD ALIGNMENT
- OVERHEAD POWER
- EXISTING PROPERTY LINES
- EROSION AND SEDIMENT CONTROL
- AREA TO BE MATTED

REV:	PROJECT TITLE:	SEQ #:
0.F	SAKONNET RIVER HDD	XXX
AFE:	MC.400264.073.10.01	PROJ NO: XXXXXX
WP NO:	XXXX	

REV	REVISION DESCRIPTION	DATE BY	CHK APPR
0.C	RE-ISSUED FOR 30% DESIGN	2023-01-20 BARR/PS1	BARR/OTC O. CANNON
0.D	RE-ISSUED FOR 60% DESIGN	2023-04-27 BARR/OTC	BARR/AFL O. CANNON
0.E	ISSUED FOR PERMITTING	2023-06-12 BARR/OTC	BARR/AFL O. CANNON
0.F	ISSUED FOR 90% REVIEW	2023-06-16 BARR/OTC	BARR/AFL O. CANNON

TEMPORARY WORKSPACE

POINT ID	NORTHING	EASTING	LATITUDE	LONGITUDE
TW-1	163159.88	411204.36	N41.530723	W71.196424
TW-2	163066.20	411253.23	N41.530466	W71.196246
TW-3	162937.06	410410.10	N41.530119	W71.199327
TW-4	162706.36	409027.89	N41.529499	W71.204378
TW-5	162618.67	408392.59	N41.529264	W71.206699
TW-6	162615.12	408330.87	N41.529255	W71.206925
TW-7	162598.42	408188.70	N41.529211	W71.207444
TW-8	162598.23	408171.04	N41.529210	W71.207509
TW-9	162612.97	408110.82	N41.529251	W71.207728
TW-10	162607.94	408045.32	N41.529238	W71.207968
TW-11	162637.63	408045.36	N41.529320	W71.207967
TW-12	162700.75	408045.32	N41.529493	W71.207967
TW-13	162937.12	408073.74	N41.530141	W71.207860
TW-14	162946.20	408370.87	N41.530164	W71.206775
TW-15	162721.13	408399.39	N41.529546	W71.206673
TW-16	163060.72	410556.94	N41.530457	W71.198789
TW-17	163068.06	410604.91	N41.530477	W71.198614

0 150 300 450

1" = 150'-0"

DWG. NO.	REFERENCE DWG.	REV	DATE	DSN	CK	DESCRIPTION
		0.F	2023-06-16	OTC	AFL	ISSUED FOR 90% DESIGN
		0.E	2023-06-12	OTC	AFL	ISSUED FOR PERMITTING
		0.D	2023-04-27	OTC	AFL	RE-ISSUED FOR 60% REVIEW
		0.C	2023-01-20	BNM	OTC	RE-ISSUED FOR 30% REVIEW
		0.B	2022-07-22	PS1	OTC	ISSUED FOR 60% REVIEW
		0.A	2022-04-15	PS1	OTC	ISSUED FOR 30% REVIEW

TITLE	INITIALS	DATE
DRAWN BY:	AAB	04-27-2023
DESIGN CHECKER:	AFL	04-27-2023
DESIGN ENGINEER:	OTC	04-27-2023
PROJECT MANAGER:	JLL	04-27-2023

CIVIL
TEMPORARY WORKSPACE LAYOUT
EAST SIDE

TITLE:

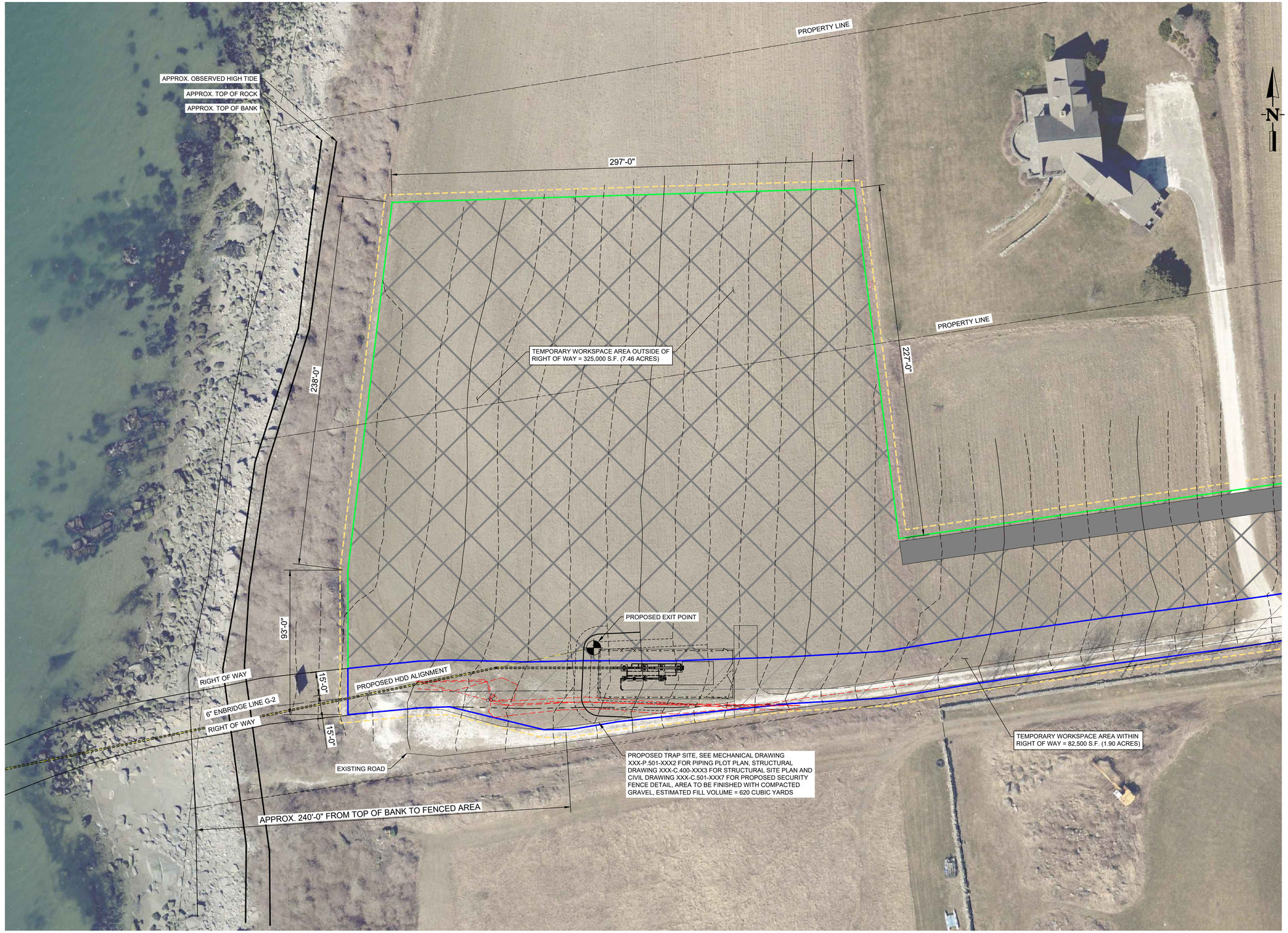
LOC.: NEWPORT COUNTY, RHODE ISLAND

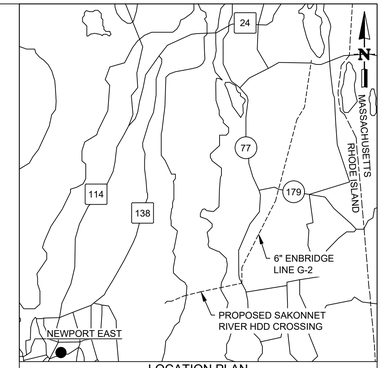
YEAR: 2022 | W.O.: | SCALE: AS SHOWN

ENBRIDGE

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 627-5400

DWG.: XXXX-C.501-XXX4 | REV.: 0.F





LOCATION PLAN

PORTSMOUTH & LITTLE COMPTON, NEWPORT COUNTY, RHODE ISLAND

NOTES:

1. REFER TO ENBRIDGE EPP FOR SITE RESTORATION SEED MIX.
2. THE ALIGNMENT OF ENBRIDGE PIPELINE G-2 IS APPROXIMATE. CONTRACTOR TO FIELD VERIFY ITS LOCATION PRIOR TO WORK.

LEGEND

- TEMPORARY WORKSPACE WITHIN THE R.O.W.
- TEMPORARY WORKSPACE OUTSIDE OF THE R.O.W.
- PROPOSED CONSTRUCTION ACCESS ROUTE
- ENBRIDGE LINE G-2
- PROPOSED HDD ALIGNMENT
- CATHODIC PROTECTION LINE
- PROPOSED SECURITY FENCE
- EROSION AND SEDIMENT CONTROL
- EXISTING CONTOUR (SHOWN IN WHITE)
- PROPOSED CONTOUR (SHOWN IN BLACK)

REV:	PROJECT TITLE:	SEQ #:
0.H	SAKONNET RIVER HDD	XXX

AFE: MC.400264.073.10.01 PROJ NO: XXXXXX

WP NO: XXXX

REV	REVISION DESCRIPTION	DATE BY	CHK APPR
0.D	RE-ISSUED FOR 60% DESIGN	2023-04-27 BARR/OTC	BARR/AFL O. CANNON
0.E	ISSUED FOR PERMITTING	2023-06-12 BARR/OTC	BARR/AFL O. CANNON
0.F	ISSUED FOR 90% REVIEW	2023-06-16 BARR/OTC	BARR/AFL O. CANNON
0.G	RE-ISSUED FOR 90% REVIEW	2023-08-31 BARR/PS1	BARR/AFL O. CANNON
0.H	RE-ISSUED FOR 90% REVIEW	2023-09-29 BARR/PS1	BARR/AFL O. CANNON

0 30 60 90

1" = 30'-0"

DWG. NO.	REFERENCE DWG.	REV	DATE	DSN	CK	DESCRIPTION
		0.G	2023-08-31	PS1	AFL	RE-ISSUED FOR 90% REVIEW
		0.F	2023-06-16	OTC	AFL	ISSUED FOR 90% REVIEW
		0.E	2023-06-12	OTC	AFL	ISSUED FOR PERMITTING
		0.D	2023-04-27	OTC	AFL	RE-ISSUED FOR 60% REVIEW
		0.C	2023-01-20	BNM	OTC	RE-ISSUED FOR 30% REVIEW
		0.B	2022-07-22	PS1	OTC	ISSUED FOR 60% REVIEW

BARR
Corporate Headquarters:
Minneapolis, Minnesota
Ph: 1-800-632-2277

TITLE	INITIALS	DATE
DRAWN BY:	AAB	07-22-2022
DESIGN CHECKER:	AFL	04-27-2023
DESIGN ENGINEER:	OTC	04-27-2023
PROJECT MANAGER:	JJL	04-27-2023

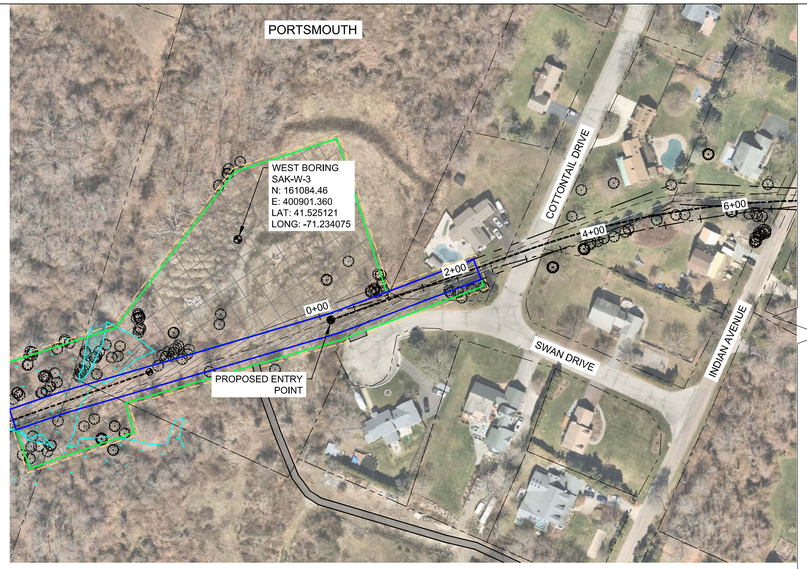
CIVIL
TEMPORARY WORKSPACE LAYOUT
CLOSE-UP, EAST SIDE
TITLE:

ENBRIDGE

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

LOC.: NEWPORT COUNTY, RHODE ISLAND

YEAR: 2022 W.O.: SCALE: AS SHOWN DWG.: XXXX-C.501-XXX5 REV.: 0.H



1 HDD SAKONNET WEST CROSSING PLAN
1"=100'-0"

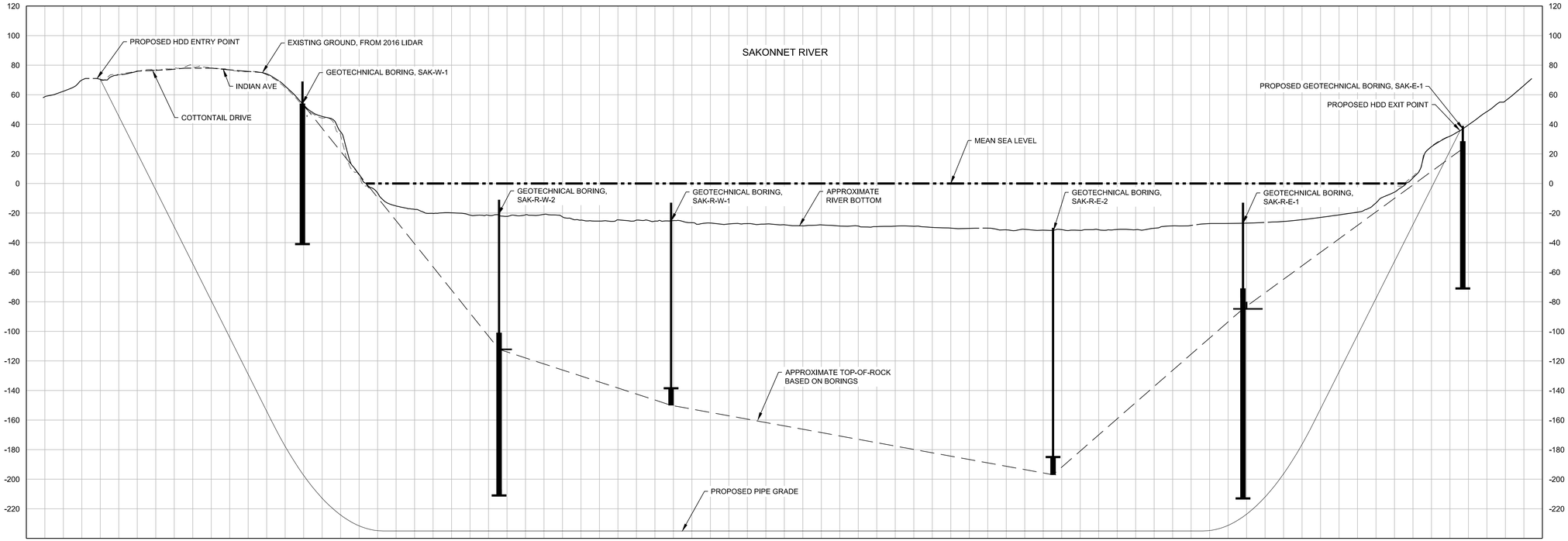
2 HDD SAKONNET EAST CROSSING PLAN
1"=200'-0"

LEGEND:

- APPROXIMATE EXISTING PIPELINE
- PROPOSED HDD ALIGNMENT
- PROPOSED TEMPORARY WORK SPACE
- WETLAND
- PROPERTY LINE

CONSTRUCTION NOTES:

1. THIS DRAWING REPRESENTS A GENERAL GRAPHIC SUMMARY OF THE WORK. WORK INCLUDES BUT IS NOT LIMITED TO WHAT IS DESCRIBED. FOR DETAILS REFER TO DRAWINGS AND PROJECT SPECIFICATIONS.
2. CONTOURS SHOWN WERE OBTAINED FROM USGS LIDAR SURVEY OBTAINED IN 2011. BATHYMETRIC DATA OF SAKONNET RIVER COLLECTED BY ONYX SERVICES 6/08/2021 TIED TO NAD83 RHODE ISLAND STATE PLANE NAVD88 US SURVEY FOOT. CONTRACTOR TO VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK.
3. CONTRACTOR IS RESPONSIBLE FOR ALL WORK UNLESS OTHERWISE NOTED.
4. ALL MEASUREMENTS ARE APPROXIMATE. VERIFY ALL DIMENSIONS IN FIELD PRIOR TO CONSTRUCTION.
5. POSITIVELY ID ALL UTILITY CROSSINGS PRIOR TO CONSTRUCTION TO VERIFY DEPTHS AND LOCATIONS.
6. COORDINATE WITH ENBRIDGE R.O.W. FOR ACCESS TO SITE.
7. DO NOT COMMENCE ANY WORK WITHOUT REQUIRED ENBRIDGE PERSONNEL ON SITE.
8. WORK SHALL BE IN ACCORDANCE WITH TO ENBRIDGE SITE PREPARATION AND EARTHWORK SPECIFICATIONS FCS001.
9. PROTECT SURVEY CONTROL POINTS. CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING ADDITIONAL CONTROL FOR CONSTRUCTION AND RECORD SURVEY ACTIVITIES.
10. DRILLED PATH SHOWN REFERS TO CENTERLINE OF PILOT HOLE, AS OPPOSED TO TOP OF INSTALLED PIPE.
11. PLACEMENT OF THE DRILL RIG IS NOT FIXED BY THE LOCATION OF THE ENTRY AND EXIT POINTS SHOWN. DRILL RIG PLACEMENT AND DRILLING METHODS ARE AT THE CONTRACTORS OPTION.

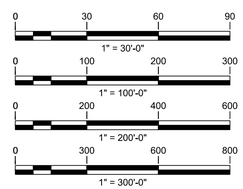


3 HDD SAKONNET RIVER CROSSING
HORIZONTAL SCALE: 1"=300'-0"
VERTICAL SCALE: 1"=30'-0"

REV:	PROJECT TITLE:	SEQ #:
0.H	SAKONNET RIVER HDD	XXX

AFE:	MC.400264.073.10.01
PROJ NO:	XXXXXX
WP NO:	XXXX

REV	REVISION DESCRIPTION	DATE BY	CHK APPR
0.E	ISSUED FOR PERMITTING	2023-06-12 BARR/PS1	BARR/AFL O. CANNON
0.F	ISSUED FOR 90% REVIEW	2023-06-16 BARR/PS1	BARR/AFL O. CANNON
0.G	RE-ISSUED FOR 90% REVIEW	2023-08-31 BARR/PS1	BARR/AFL O. CANNON
0.H	RE-ISSUED FOR 90% REVIEW	2023-09-29 BARR/PS1	BARR/AFL O. CANNON



DWG. NO.	REFERENCE DWG.	REV	DATE	DSN	CK	DESCRIPTION
		0.F	2023-06-16	OTC	AFL	ISSUED FOR 90% REVIEW
		0.E	2023-06-12	PS1	AFL	ISSUED FOR PERMITTING
		0.D	2023-04-27	OTC	AFL	RE-ISSUED FOR 60% REVIEW
		0.C	2023-01-20	BNM	OTC	RE-ISSUED FOR 30% REVIEW
		0.B	2022-07-22	AAB	OTC	ISSUED FOR 60% REVIEW
		0.A	2022-04-15	PSI		ISSUED FOR 30% REVIEW

BARR
Corporate Headquarters:
Minneapolis, Minnesota
Ph: 1-800-632-2277

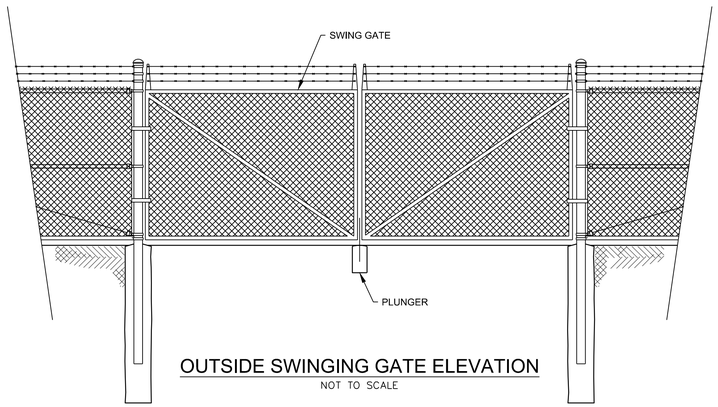
DRAWN BY:	AAB	07-22-2022
DESIGN CHECKER:	AFL	04-27-2023
DESIGN ENGINEER:	OTC	04-27-2023
PROJECT MANAGER:	JLL	04-27-2023
TITLE	INITIALS	DATE

CIVIL
PLAN AND PROFILE
TITLE:

ENBRIDGE
Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 627-5400

LOC.: NEWPORT COUNTY, RHODE ISLAND

YEAR: 2022 | W.O.: | SCALE: AS SHOWN | DWG.: XXXX-C.501-XXX6 | REV.: 0.H



OUTSIDE SWINGING GATE ELEVATION
NOT TO SCALE

A SECURITY CANTILEVER SLIDE GATE
NTS

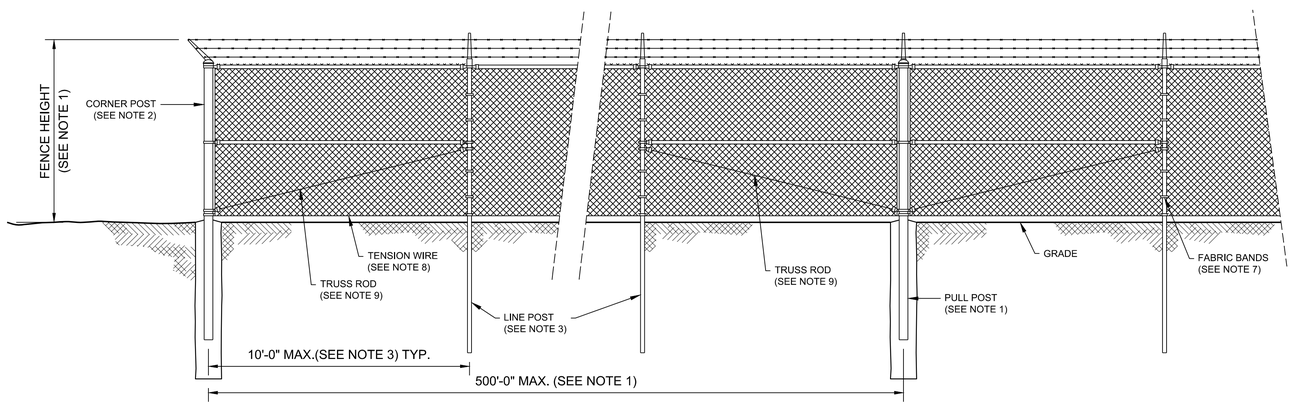
GATE SCHEDULE	
NOTE: GATE POSTS: 11'-0" LONG, DIAMETER AS NOTED	
GATE OPENING =(A)	GATE POST O.D.
FOR SWING GATES: LESS THAN 7'-0"	3 1/2"
FOR SLIDING (ROLLING) GATE: UP TO 25'-0"	4 1/2"

FENCING SPECIFICATION AND MATERIALS

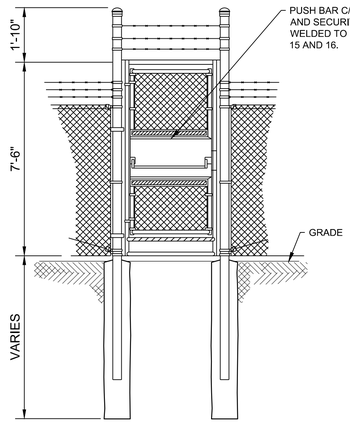
FENCE SHALL BE CONSTRUCTED FROM ASTM F1043 GROUP 1A OR GROUP 1C ROUND STEEL PIPE FRAMING AND CHAIN LINK FABRIC WITH BARBED WIRE OVERHANG. SPECIFIED PIPE DIAMETERS ARE ACTUAL OUTSIDE DIAMETER. FENCE DESIGN AND CONSTRUCTION SHALL BE IN CONFORMANCE WITH ASTM F2611 - STANDARD GUIDE FOR DESIGN AND CONSTRUCTION OF CHAIN LINK SECURITY FENCING IN ADDITION TO THE FOLLOWING MINIMUM REQUIREMENTS:

1. HEIGHT: 7'-0" ABOVE FINISHED GRADE INCLUDING BARBED WIRE OVERHANG.
2. POSTS: TERMINAL POSTS, CORNER POSTS AND PULL POSTS 3 1/2" O.D. X 11'-0" LONG. PULL POSTS SHALL NOT EXCEED 500'-0" SPACING. POST CONCRETE FOOTINGS SHALL BE CAST INTO 12" DIAMETER X 6'-0" DEEP AUGERED HOLES.
3. LINE POST: 2 3/8" O.D. AT A SPACING OF 10'-0" MAX. DRIVE SET A MINIMUM OF 6'-0" DEEP.
4. TOP RAIL: 1 5/8" O.D. THE TOP RAIL SHALL BE JOINED WITH 6" OUTER SLEEVE TO FORM A CONTINUOUS BRACE FOR EACH STRETCH OF FENCE AND SECURED TO TERMINAL POSTS, CORNER POSTS, GATE POSTS, AND PULL POSTS.
5. BRACING: 1 5/8" O.D. HORIZONTAL MID BRACE LOCATED AT: TERMINAL POSTS, CORNER POSTS, GATE POSTS, PULL POSTS, AND TERMINATING AT THE FIRST LINE POST. BRACE ASSEMBLY INCLUDES A 3/8" TRUSS ROD
6. FITTINGS: ALL FITTINGS SHALL BE INSTALLED SO AS TO PREVENT TAMPERING FROM OUTSIDE THE FENCED AREA.
7. FABRIC: WOVEN FROM 9 GAUGE MIN., CLASS 1, (1.2 OZ/FT^2) GALVANIZED WIRE, AND WOVEN INTO 2"X2" MESH, TOP OF FABRIC BARBED, BOTTOM KNUCKLED.
8. TENSION WIRE: 7 GAUGE, 1.2 OZ/FT^2 GALVANIZED WIRE, STRETCH TIGHT AND SECURE TO BOTTOMS OF ALL POSTS. SECURE WITH HOG RINGS EVERY 12".
9. FABRIC WIRE: FABRIC SHALL BE FASTENED TO TOP RAIL, AND TO BOTTOM TENSION WIRE AT 1'-0" INTERVALS AND SECURED TO ALL POSTS VERTICALLY AT 1-0" INTERVALS.
10. BARBED ARMS: CAST ALUMINUM OR GALVANIZED ARM TO ACCOMMODATE THREE RUNS OF BARBED WIRE AT 45 DEGREE OVERHANG TO THE OUTSIDE, 1'-0" ABOVE FABRIC.
11. BARBED WIRE: TWO STRAND, 12.5 GAUGE GALVANIZED WIRE, WITH 14 GAUGE 4 POINT BARBS AT 5" O/C GALVANIZED.
12. FOOTINGS: MINIMUM CONCRETE 3000 PSI SULPHATE RESISTANT CEMENT WHERE SPECIFIED. DOME SHAPE TOPS OF FOOTINGS TO PROVIDE WATER DRAINAGE.
13. ROLLING GATES: ROLLING (SLIDE) GATE TYPE II, CLASS I PER ASTM F1184. FRAME WITH GALVANIZED PIPE, WELDED JOINTS. 2 3/8" O.D. GATES SHALL HAVE LATCHING DEVICES WITH A PROVISION FOR PADLOCKS & CHAIN. SLIDING GATES SHALL HAVE SEMI-AUTOMATIC OUTER LATCHES.
14. GATE POST: SEE GATE SCHEDULE.
15. EMERGENCY EVAC GATE: SEE DRAWING D-1.8-5827-0TDD FOR DETAIL. PROVIDE MINIMUM 270° SWING.
16. DRAWING SUBMITTAL: CONTRACTOR MAY UTILIZE APPROVED GATE DESIGN. CONTRACTOR TO SUBMIT DRAWINGS FOR ALTERNATE GATE DESIGN APPROVAL.

1 SLIDING GATE
NTS
THIS DRAWING



B SECURITY FENCE N? ELEVATION
NTS



C EVACUATION GATE
NTS

REV:	PROJECT TITLE:	SEQ #:
0.G	SAKONNET RIVER HDD	XXX

AFE: MC.400264.073.10.01 PROJ NO: XXXXXX
WP NO: XXXX

REV	REVISION DESCRIPTION	DATE BY	CHK APPR
0.A	ISSUED FOR 30% REVIEW	2022-04-15 BARR/PS1	BARR/OTC O. CANNON
0.B	ISSUED FOR 60% REVIEW	2022-07-22 BARR/PS1	BARR/OTC O. CANNON
0.C	RE-ISSUED FOR 30% REVIEW	2023-01-20 BARR/PS1	BARR/OTC O. CANNON
0.D	RE-ISSUED FOR 60% REVIEW	2022-04-27 BARR/OTC	BARR/AFL O. CANNON
0.E	ISSUED FOR PERMITTING	2023-06-12 BARR/PS1	BARR/AFL O. CANNON
0.F	ISSUED FOR 90% REVIEW	2023-06-16 BARR/PS1	BARR/OTC O. CANNON
0.G	RE-ISSUED FOR 90% REVIEW	2023-08-31 BARR/PS1	BARR/AFL O. CANNON

DWG. NO.	REFERENCE DWG.	REV	DATE	DSN	CK	DESCRIPTION
		0.G	2023-08-31	PS1	AFL	RE-ISSUED FOR 90% REVIEW
		0.F	2023-06-16	PS1	OTC	ISSUED FOR 90% REVIEW
		0.E	2023-06-08	PS1	AFL	ISSUED FOR PERMITTING
		0.D	2023-04-27	OTC	AFL	RE-ISSUED FOR 60% REVIEW
		0.C	2023-01-20	BNM	OTC	RE-ISSUED FOR 30% REVIEW
		0.B	2022-07-22	PS1	OTC	ISSUED FOR 60% REVIEW

BARR
Corporate Headquarters:
Minneapolis, Minnesota
Ph: 1-800-632-2277

TITLE	INITIALS	DATE
DRAWN BY:	PS1	07-22-2022
DESIGN CHECKER:	AFL	
DESIGN ENGINEER:	OTC	
PROJECT MANAGER:	JJL	

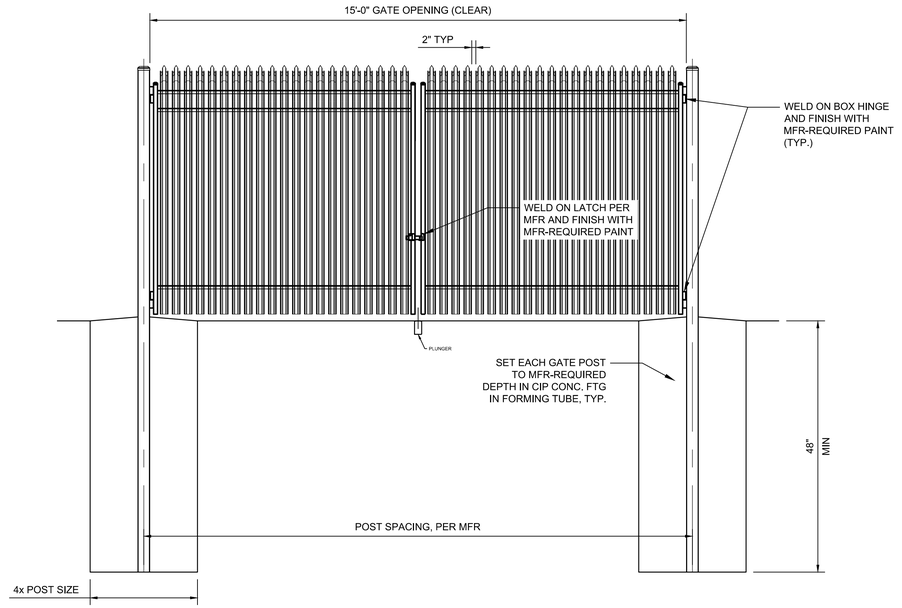
TITLE: CIVIL
SECURITY FENCE
SECTIONS & DETAILS

LOC.: NEWPORT COUNTY, RHODE ISLAND
YEAR: 2022 W.O.: SCALE: NTS

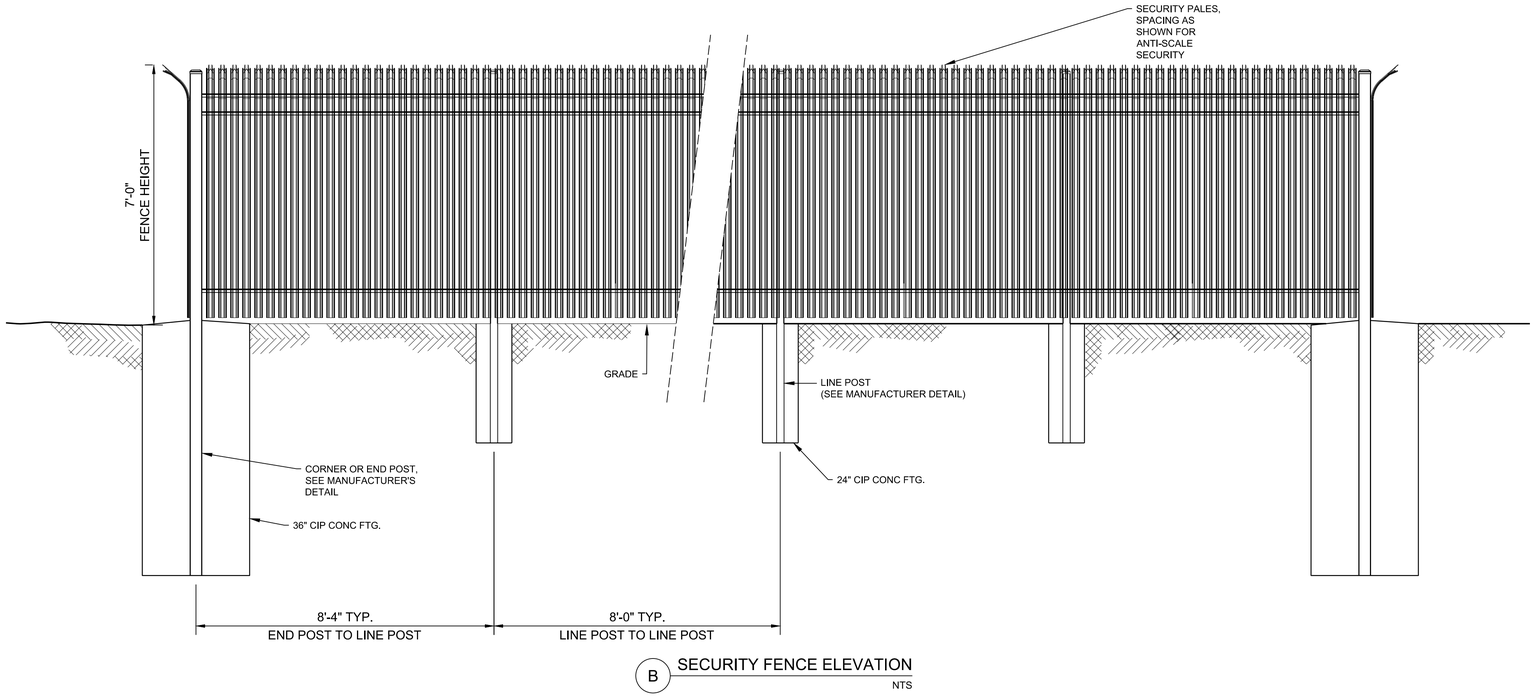
ENBRIDGE
Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 : 627-5400

DWG.: XXXX-C.501-XXX7 REV.: 0.G

NOTES:
1. ALL FENCES AND GATES MUST BE IMPASSE II SYSTEM BY AMERISTAR FENCING.
2. PROVIDE ALL MANUFACTURE-RECOMMENDED HARDWARE AND FINISHING.
3. PROVIDE 3" x 2.75" X 12GA. STEEL I-BEAM POSTS AS ALL FENCE POSTS. FINISH FENCE POSTS TO MATCH FENCE PER MANUFACTURER'S RECOMMENDATIONS.



A SECURITY DOUBLE-SWING GATE
NTS



B SECURITY FENCE ELEVATION
NTS

REV:	PROJECT TITLE:	SEQ #:
0.C	SAKONNET RIVER HDD	XXX

AFE:	MC.400264.073.10.01	PROJ NO:	XXXXXX
WP NO:	XXXX		

REV	REVISION DESCRIPTION	DATE BY	CHK APPR
0.A	RE-ISSUED FOR 60% DESIGN	2023-04-27 BARR/AMW	BARR/AFL O. CANNON
0.B	ISSUED FOR 90% DESIGN	2023-06-16 BARR/AMW	BARR/AFL O. CANNON
0.C	RE-ISSUED FOR 90% REVIEW	2023-08-31 BARR/PS1	BARR/AFL O. CANNON

DWG. NO.	REFERENCE DWG.	REV	DATE	DSN	CK	DESCRIPTION
		0.C	2023-08-31	PS1	AFL	RE-ISSUED FOR 90% REVIEW
		0.B	2023-06-16	AMW	AFL	ISSUED FOR 90% REVIEW

BARR
Corporate Headquarters:
Minneapolis, Minnesota
Ph: 1-800-632-2277

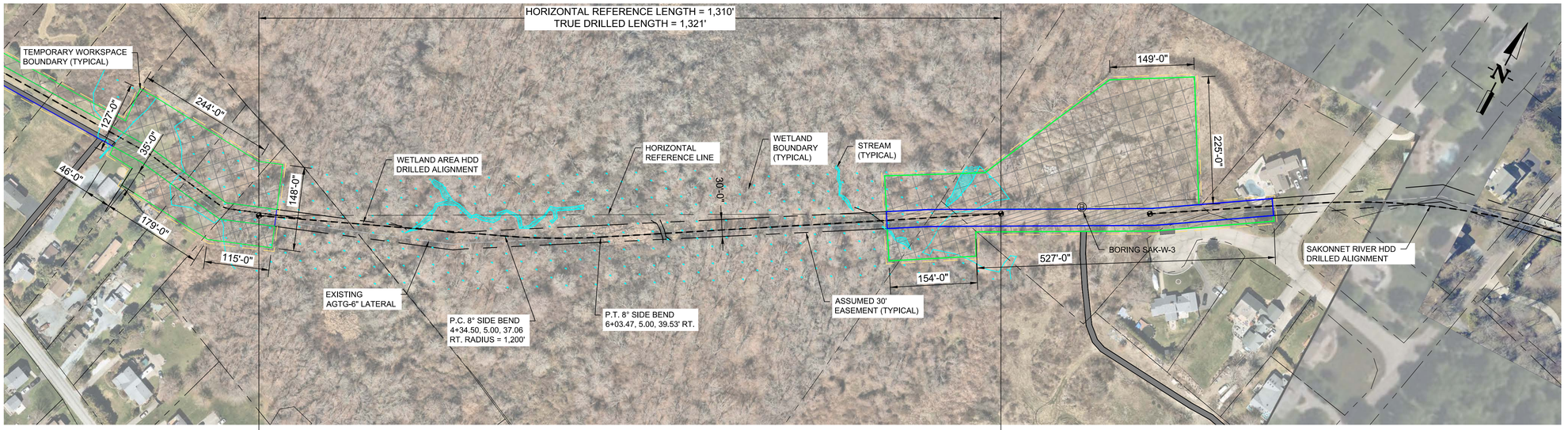
	INITIALS	DATE
DRAWN BY:	AMW	06-16-2023
DESIGN CHECKER:	AFL	
DESIGN ENGINEER:	OTC	
PROJECT MANAGER:	JJL	

TITLE: CIVIL
SECURITY FENCE
SECTIONS & DETAILS
(ALTERNATE)

LOC.: NEWPORT COUNTY, RHODE ISLAND

YEAR: 2023 | W.O.: | SCALE: NTS | DWG.: XXXX-C.501-XXX7-ALT | REV.: 0.C

ENBRIDGE
Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 · 627-5400

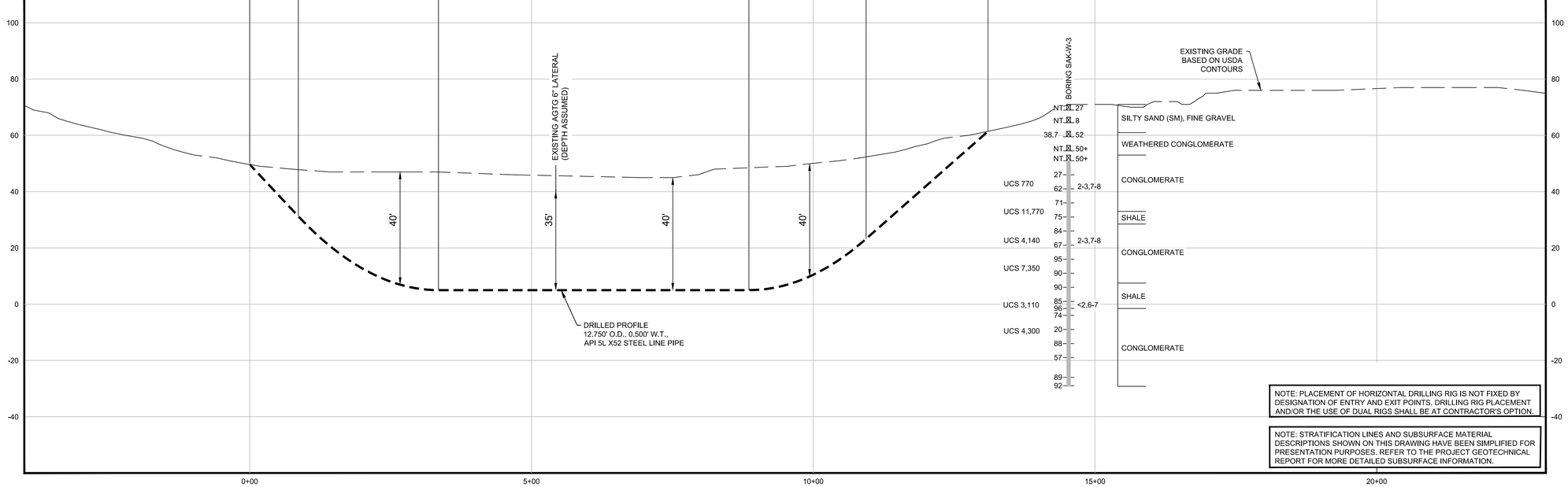


1 PLAN: HDD ALIGNMENT (WETLAND AREA)

1"=100'-0"

ENTRY POINT @ 12°
0+00.00, 49.65, 0.00' RT.
N 160259, E 399664.62

EXIT POINT @ 10°
13+10.29, 61.45, 0.00' RT.
N 160877.86, E 400819.86



NOTE: PLACEMENT OF HORIZONTAL DRILLING RIG IS NOT FIXED BY DESIGNATION OF ENTRY AND EXIT POINTS. DRILLING RIG PLACEMENT AND/OR THE USE OF DUAL RIGS SHALL BE AT CONTRACTOR'S OPTION.

NOTE: STRATIFICATION LINES AND SUBSURFACE MATERIAL DESCRIPTIONS SHOWN ON THIS DRAWING HAVE BEEN SIMPLIFIED FOR PRESENTATION PURPOSES. REFER TO THE PROJECT GEOTECHNICAL REPORT FOR MORE DETAILED SUBSURFACE INFORMATION.

2 PROFILE: HDD PRFILE (WETLAND AREA)

HORIZONTAL SCALE: 1"=100'-0"
VERTICAL SCALE: 1"=20'-0"

LEGEND:

- DRILLED PATH ENTRY/EXIT POINT
- TEMPORARY WORKSPACE WITHIN THE R.O.W. WORKSPACE IN WETLAND TO BE MATTED
- TEMPORARY WORKSPACE OUTSIDE OF THE R.O.W., WORKSPACE IN WETLAND TO BE MATTED
- EXISTING WETLAND AREA
- EXISTING WATER BODY
- TEMPORARY ACCESS ROUTE
- PROPERTY LINE

GEOTECHNICAL LEGEND

Ⓑ BORING LOCATION

SPLIT SPOON SAMPLE
53 / 23 ← PENETRATION RESISTANCE IN BLOWS PER FOOT FOR A 140 POUND HAMMER FALLING 30 INCHES
PERCENTAGE OF GRAVEL BY WEIGHT FOR SAMPLES CONTAINING GRAVEL

UCS 6,250 ← UNCONFINED COMPRESSIVE STRENGTH (TSF)
53 / 6 ← MOHS HARDNESS
ROCK QUALITY DESIGNATION (PERCENT)

GEOTECHNICAL NOTES:

1. GEOTECHNICAL INVESTIGATION WAS PERFORMED BY BARR ENGINEERING. REFER TO THE GEOTECHNICAL DATA REPORT (REV. 1), DATED JULY 2022 AND REVISED APRIL 2023 FOR DETAILED SUBSURFACE INFORMATION.
2. THE LETTERS "NT" TO THE LEFT OF THE DRILL LOG INDICATE THAT GRAVEL WAS OBSERVED BUT NO GRADATION TEST WAS PERFORMED.
3. THE GEOTECHNICAL DATA IS ONLY DESCRIPTIVE OF THE LOCATIONS ACTUALLY SAMPLED.

TOPOGRAPHIC SURVEY NOTES:

1. THE ALIGNMENT OF ENBRIDGE PIPELINE G-2 IS APPROXIMATE. FIELD VERIFY ITS LOCATION PRIOR TO WORK .
2. NORTHINGS AND EASTINGS ARE IN U.S. SURVEY FEET REFERENCED TO RHODE ISLAND STATE PLANE COORDINATES, NAD 83.
3. ELEVATIONS ARE IN FEET REFERENCED TO NAVD 88.

DRILLED PATH NOTES:

1. DRILLED PATH STATIONING IS IN FEET BY HORIZONAL MEASUREMENT AND IS REFERENCED TO CONTROL ESTABLISHED FOR THE DRILLED SEGMENT.
2. DRILLED PATH COORDINATES REFER TO CENTERLINE OF PILOT HOLE AS OPPOSED TO TOP OF INSTALLED PIPE.

PILOT HOLE TOLERANCES:

THE PILOT HOLE SHALL BE DRILLED TO THE TOLERANCES LISTED BELOW. HOWEVER, IN ALL CASES, RIGHT-OF-WAY RESTRICTIONS AND CONCERN FOR ADJACENT FACILITIES SHALL TAKE PRECEDENCE OVER THESE TOLERANCES.

1. ENTRY POINT: UP TO 5 FEET FORWARD OR BACK FROM THE DESIGNED ENTRY POINT; UP TO 5 FEET RIGHT OR LEFT OF DESIGNED ALIGNMENT.
2. EXIT POINT: UP TO 10 FEET SHORT OR 20 FEET LONG RELATIVE TO THE DESIGNED EXIT POINT; UP TO 5 FEET RIGHT OR LEFT OF THE DESIGNED ALIGNMENT.
3. ELEVATION: UP TO 3 FEET ABOVE AND 10 FEET BELOW THE DESIGNED PROFILE.
4. ALIGNMENT: UP TO 5 FEET RIGHT OR LEFT OF THE DESIGNED ALIGNMENT
5. CURVE RADIUS: NO LESS THAN 800 FEET BASED ON A 3-JOINT AVERAGE (ASSUMING RANGE 2 DRILL PIPE)

PROTECTION OF EXISTING FACILITIES:

CONTRACTOR SHALL UNDERTAKE THE FOLLOWING STEPS PRIOR TO COMMENCING DRILLING OPERATIONS.

1. CONTACT THE UTILITY LOCATION/NOTIFICATION SEVICE FOR THE CONSTRUCTION AREA.
2. POSITIVELY LOCATE AND STAKE ALL EXISTING UNDERGROUND FACILITIES. ANY FACILITIES LOCATED WITHIN 10 FEET OF THE DESIGNED DRILL PATH SHALL BE EXPOSED.
3. MODIFY DRILLING PRACTICES AND DOWNHOLE ASSEMBLIES AS NECESSARY TO PREVENT DAMAGE TO EXISTING FACILITIES.

0 20 40 60
1" = 20'-0"

0 100 200 300
1" = 100'-0"

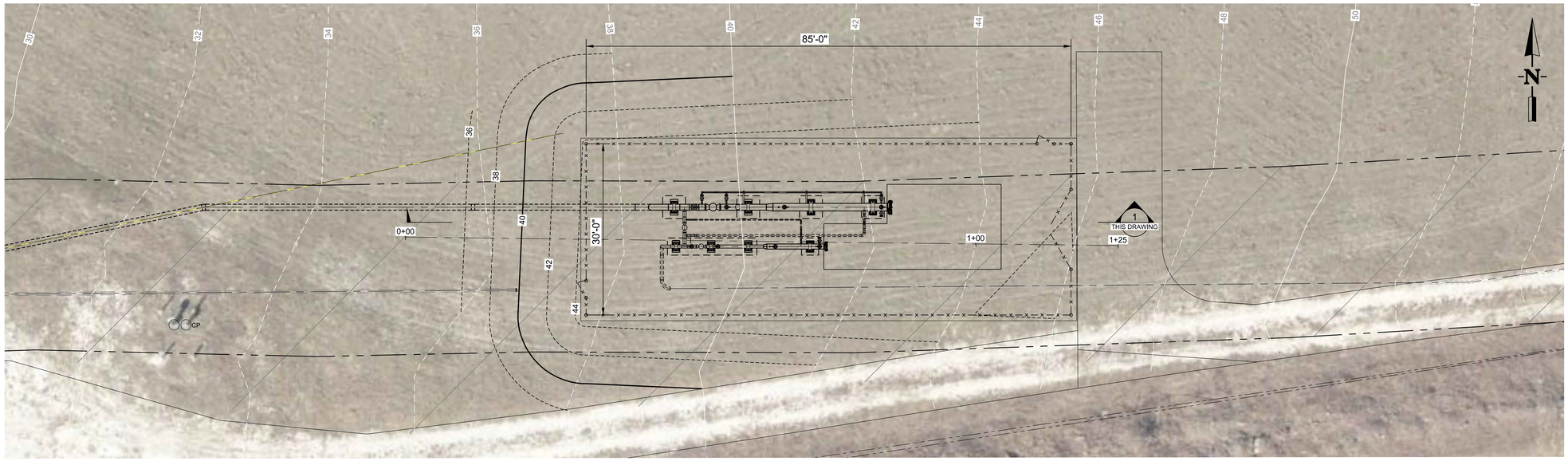
DWG. NO.	REFERENCE DWG.	REV	DATE	DSN	CK	DESCRIPTION
		0.C	2023-09-29	PS1	OTC	RE-ISSUED FOR 90% REVIEW
		0.B	2023-08-31	PS1	AFL	RE-ISSUED FOR 90% REVIEW
		0.A	2023-06-26	PS1	AFL	ISSUED FOR PERMITTING

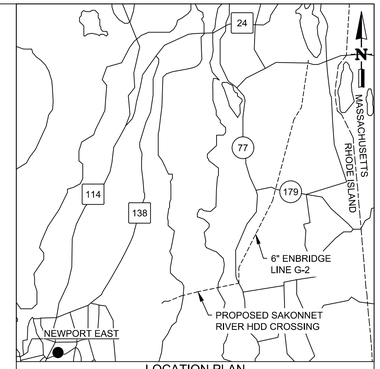
BARR
Corporate Headquarters:
Minneapolis, Minnesota
Ph: 1-800-632-2277

DRAWN BY:	PS1	06-08-2023	CIVIL HDD PLAN AND PROFILE WETLAND AREA
DESIGN CHECKER:	AFL		
DESIGN ENGINEER:	OTC		TITLE:
PROJECT MANAGER:	JLL		LOC.: NEWPORT, RHODE ISLAND
TITLE	INITIALS	DATE	YEAR: 2023 / W.O.: / SCALE: AS SHOWN

ENBRIDGE
Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

DWG.: XXXX-C.501-XXX8 REV.: 0.C





LOCATION PLAN

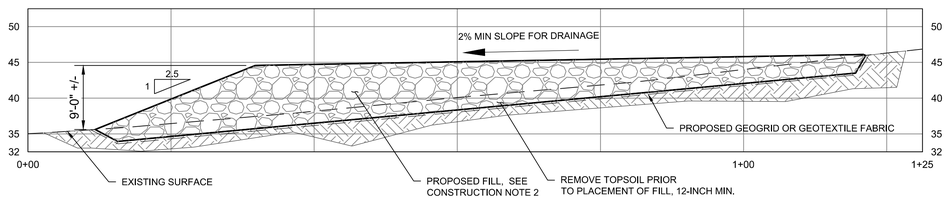
PORTSMOUTH & LITTLE COMPTON, NEWPORT COUNTY, RHODE ISLAND

CONSTRUCTION NOTES:

1. NOTIFY THE RHODE ISLAND SAFE DIG SERVICE TO HAVE BURIED UTILITIES MARKED PRIOR TO EXCAVATION.
2. UTILITY MARKERS TO BE CLEARLY VISIBLE PRIOR TO AND DURING THE DURATION OF WORK.
3. PERFORM A 4-WAY SWEEP TO IDENTIFY UNDERGROUND UTILITIES.
4. THE ALIGNMENT OF ENBRIDGE PIPELINE G-2 IS APPROXIMATE. CONTRACTOR TO FIELD VERIFY ITS LOCATION PRIOR TO WORK.
5. CIVIL PLATFORM TO BE CONSTRUCTED USING "BANK RUN PROCESSED SAND AND GRAVEL" PER RHODE ISLAND DOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, SECTION M-1, OR APPROVED ALTERNATE MATERIAL.
6. PLACE FILL IN 8-INCH MAXIMUM LOOSE LIFTS AND COMPACT TO 95% STANDARD PROCTOR MAXIMUM DRY DENSITY OR GREATER. ADJUST THE MOISTURE CONTENT OF THE FILL MATERIAL, AS NEEDED, TO ACHIEVE TARGET COMPACTION.
7. RESTORE DISTURBED AREAS BY GRADING, SPREADING TOPSOIL, SPREADING THE RECOMMENDED SEED MIX IN THE ENVIRONMENTAL PROTECTION PLAN, AND COVERING WITH MULCH OR STRAW.

LEGEND

- ENBRIDGE LINE G-2
- PROPOSED HDD ALIGNMENT
- CATHODIC PROTECTION LINE
- PROPOSED SECURITY FENCE
- EXISTING CONTOUR (SHOWN IN WHITE)
- PROPOSED CONTOUR (SHOWN IN BLACK)



1 SECTION: CIVIL PLATFORM FOR TRAPS

1" = 10'

THIS DRAWING

REV:	PROJECT TITLE:	SEQ #:
0.B	SAKONNET RIVER HDD	XXX

AFE:	MC.400264.073.10.01	PROJ NO:	XXXXXX
WP NO:	XXXX		

REV	REVISION DESCRIPTION	DATE BY	CHK APPR
0.A	ISSUED FOR 90% REVIEW	2023-06-16 BARR/PS1	BARR/OTC O. CANNON
0.B	RE-ISSUED FOR 90% REVIEW	2023-08-31 BARR/PS1	BARR/AFL O. CANNON

0 30 60 90

1" = 30'-0"

DWG. NO.	REFERENCE DWG.	REV	DATE	DSN	CK	DESCRIPTION
		0.B	2023-08-31	PS1	AFL	RE-ISSUED FOR 90% REVIEW
		0.A	2022-04-15	PS1	OTC	ISSUED FOR 90% REVIEW

BARR
Corporate Headquarters:
Minneapolis, Minnesota
Ph: 1-800-632-2277

DRAWN BY:	PS1	06-12-2023	CIVIL GRADING PLAN PLAN AND SECTION
DESIGN CHECKER:	OTC	06-15-2023	
DESIGN ENGINEER:	OTC	06-16-2023	TITLE:
PROJECT MANAGER:	JJL	06-16-2023	LOC.: NEWPORT COUNTY, RHODE ISLAND

TITLE	INITIALS	DATE	YEAR: 2023	W.O.:	SCALE: AS SHOWN	DWG.: XXXX-C.501-XXX9	REV.: 0.B

ENBRIDGE

Algonquin Gas Transmission, LLC
5400 Westheimer Ct. Houston, TX 77056-5310 713 · 627-5400

Attachment C
Algonquin's Erosion and Sediment Control Plan (E&SCP) and Spill Prevention Control Countermeasure Plan (SPCC)

Erosion and Sedimentation Control Plan

Company: **Texas Eastern Transmission, LP**

Project: **Sakonnet River Line 2 HDD Replacement Project**

Location: **Portsmouth and Little Compton, Rhode Island**

Effective 6 June, 2014
Revised September 2017

Environmental Construction Permitting
5400 Westheimer Court
Houston, Texas 77056-5310

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LIST OF FIGURES

APPENDIX A

LIST OF FIGURES, continued

DEFINITIONS

7(c) – Activities authorized under a project-specific Certificate of Public Convenience and Necessity from the Federal Energy Regulatory Commission (FERC), pursuant to Section 7(c) of the Natural Gas Act, to transport or sell natural gas, as well as construct, acquire, extend, alter or operate specific natural gas facilities that provide natural gas service.

Abandonment – Permanent reduction in the availability for service of a FERC jurisdictional facility, including facility modifications which would result in changes to certificated parameters (e.g., permanently operating compressors at lower than certificated horsepower or pipelines at lower than certificated design pressures) as well as changes in operating status (e.g., abandoned-in-place, idled and not maintained, decommissioned or removed facilities). Abandonment of pipe or facilities may be authorized under the blanket certificate or a project-specific Order of Abandonment by FERC, in accordance with Section 7(b) of the Natural Gas Act.

Agricultural Land – Actively cultivated and rotated land used for the production of crops including but not limited to corn, grains, orchards, vineyards and hayfields.

Blanket Certificate Project – Blanket certificate authorization is obtained from FERC by the Company and allows the Company to construct, modify, acquire, operate, and abandon a limited set of natural gas facilities, and offer a set of services without the need for further activity-specific certificate authorizations. Regulations for FERC's Blanket Certificate program are provided under Title 18 CFR Part 157, Subpart F. Examples of these projects include, but is not limited to, pipe replacements requiring new permanent right-of-way (ROW) or temporary workspace outside of the original construction footprint, miscellaneous pipe rearrangements, new receipt and delivery points, abandonments, temporary compression facilities, underground storage field remediation and maintenance activities, and underground storage testing and development activities.

Chief Inspector – Person, designated by the Company, responsible for the quality assurance of construction activities on a project by managing on-site project inspection staff and ensuring the construction contractor meets the requirements of the Company's construction specifications, permits, and any plans and drawings related to specific construction activities. All inspectors on the project report to the Chief Inspector and the Chief Inspector reports to the Company's Construction Superintendent.

Clearance Package/Permit Book – The document issued by the Company's Environmental Construction Permitting (ECP) Department that contains all of the necessary environmental permits, clearances, plans and other requirements specific to a project. The Clearance Package/Permit Book is also included as part of the construction contract.

Deviation – A change to the placement of work limits, structures specified in the construction drawings, or changes in the design of control measures as set forth in the E&SCP, with the exception of minor variations from specifications in the typical E&SCP figures (refer to Appendix A) that are required due to site-specific conditions and which are designed to achieve an equivalent or greater degree of environmental protection.

Environmental Inspector (EI) – On-site Company representative responsible for inspecting and verifying site compliance with environmental conditions identified in the E&SCP as well as project-specific terms and conditions

contained within the Clearance Package / Permit Book. The environmental inspector will perform the duties that are outlined in Section 2.1 of this plan.

Ephemeral stream – Waterbody which flows water only during precipitation events in a typical year and for a short duration after the events. Runoff from rainfall is the primary source of water for stream flow. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream.

Intermediate waterbody – Defined by FERC as a waterbody greater than 10 feet wide but less than or equal to 100 feet wide, measured from water's edge to water's edge at the time of construction.

Intermittent stream – Waterbody which flows during certain times of the year when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.

Line List – A list prepared by the Company of project-specific instructions for all properties affected by the project, specifying each property owner, the length of crossing, and any special instructions or restrictions for construction crew(s).

Major waterbody – Defined by FERC as a waterbody greater than 100 feet wide, measured at the water's edge at the time of construction.

Minor waterbody – Defined by FERC as a waterbody less than or equal to 10 feet wide, measured at the water's edge at the time of construction.

Pasture – Non-forested land used for grazing of domesticated livestock (horses, cattle, sheep, etc.). Pasture receives periodic renovation and treatments such as tillage, fertilization, mowing, weed control, and may be irrigated. Typical vegetation consists primarily of grasses, herbaceous plants, legumes, and forbs.

Perennial stream – Waterbody which flows water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow and runoff from rainfall is a supplemental source of water for stream flow.

Riparian area – Ecosystems that occupy the transitional zone between terrestrial and aquatic ecosystems. Typical examples of riparian areas include floodplains, streambanks, and lakeshores.

Spill Prevention, Control and Countermeasure Plan /
Preparedness, Prevention and Contingency Plan for Construction Projects (SPCC / PPC Plan) – Company document that contains measures to prevent or reduce the risk of spills or accidental exposure of oil or hazardous materials associated with construction activities, as well as procedures to be employed in the event of a spill, including measures that provide for prompt and effective cleanup of spills, notifications and proper disposal of waste generated during cleanup.

State-designated waterbody – Waterbodies specifically identified or recognized by the States or authorized Indian Tribe for water use, value or quality. Designations take into consideration the protection and propagation fish, shellfish and wildlife, as well as use and value for public water supplies, agricultural, industrial, recreational and other purposes, such as navigation. FERC's Procedures contain specific requirements with regards to state-designated fisheries.

Sensitive resource area – Areas (defined by FERC) that include wetlands, waterbodies, cultural resource sites, or sensitive species habitats.

Take up-and-Relay Pipeline Construction – Also called “lift and relay”, Company construction terminology for the removal of existing pipe and installation of new pipe at the same alignment within the existing permanent easement.

Wetland – Areas that are inundated or saturated by surface or groundwater at a frequency or duration sufficient to support and, under normal circumstances, do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Types of wetlands include swamps, marshes, bogs, sloughs, wet meadows, mudflats and natural ponds.

Waterbody – Any natural or artificial stream, river, or drainage with perceptible flow at the time of crossing during construction, as well as other permanent waterbodies such as ponds and lakes.

1. INTRODUCTION

1.1 PURPOSE OF THIS PLAN

This Erosion and Sedimentation Control Plan (E&SCP) has been prepared for use by the Company and its contractors as a guidance manual for minimizing erosion of disturbed soils and transportation of sediments off the construction ROW and into sensitive resource and residential areas during natural gas construction projects. The procedures developed in this plan, which represent the Company's best management practices, are designed to accommodate varying field conditions while achieving compliance with regulatory requirements and protecting environmentally sensitive areas.

This E&SCP is designed to provide guidelines, best management practices and typical techniques for the installation and implementation of soil erosion and sediment control measures while permitting adequate flexibility to use the most appropriate best management practice measures based on site-specific conditions. The intent of the E&SCP is to provide general information on the pipeline construction process and sequence, and to describe specific measures that will be employed during and following construction to minimize impacts to the environment.

Figures provided in Appendix A of this plan illustrate typical and minimum requirements of best management practices for design and utilization of construction workspace areas, access roads and erosion controls, as well as construction methods for special use areas (e.g., agricultural and residential land) and crossing of features during pipeline construction, including wetlands, waterbodies and roads. References to specific figure numbers provided in Appendix A are indicated throughout the E&SCP.

The goal of the E&SCP is to preserve the integrity of environmentally sensitive areas and to maintain existing water quality by:

- Minimizing the extent and duration of disturbance;
- Diverting runoff to stabilized areas;
- Installing temporary and permanent erosion control measures; and
- Establishing an effective inspection and maintenance program.

The E&SCP is intended to be used on Company projects that have been authorized by Federal Energy Regulatory Commission (FERC) pursuant to Section 7(b) and/or 7(c) of the Natural Gas Act to construct, acquire, alter, abandon or operate gas facilities or to provide gas services. This plan is also intended to be used for projects that are conducted under Company's blanket certificate which are regulated under 18 CFR Part 157, Subpart F. All blanket certificate projects that involve ground disturbance or changes to operational air and noise emissions are subject to the FERC's standard environmental conditions, including adherence to FERC's *Upland Erosion Control, Revegetation and Maintenance Plan* (Plan) and *Wetland and Waterbody Construction and Mitigation Procedures* (Procedures), May 2013 Version.

1.2 GUIDELINES AND REQUIREMENTS

The measures described in this E&SCP have been developed based on guidelines from the FERC, United States Army Corps of Engineers (COE), the United States Fish and Wildlife Service, the United States Department of Agriculture, the Natural Resource Conservation Service, and various state agencies as well as from the Company's

significant experience and practical knowledge of pipeline construction and effective environmental protection measures. Lessons and insights gained during pipeline construction projects and comments from agency representatives are also incorporated into this E&SCP.

In accordance with FERC regulations, projects under the jurisdiction of Section 7 or the Company's blanket certificate are required to comply with the FERC's Plan and Procedures unless written approval to deviate from the Plan or Procedures is received from the Director of the Office of Energy Projects and the appropriate state agency. This revised version of the E&SCP is consistent with the requirements of FERC's Plan and Procedures (May 2013 version).

If conflicts or differences occur between project-specific conditions of appropriate federal and state agencies and the best management practices described in this E&SCP, consult with the Company Environmental Construction Permitting Department (ECP) representative or ECP Lead. The more stringent or site-specific requirement is typically applicable unless otherwise approved by ECP. With the exception of minor variations from the typical figures that may be required due to site-specific conditions and are designed to achieve an equivalent or greater degree of environmental protection, any deviations from the construction drawings or changes in the design of control measures as set forth in this E&SCP must be approved by the Company's ECP Lead and the appropriate permitting agency prior to implementation. Measures and practices identified within this plan are to be implemented during construction unless otherwise specified by project-specific permit conditions.

1.3 SURVEYS, PERMITS & NOTIFICATIONS

The Company shall perform the required environmental field surveys and acquire the necessary environmental permits, clearances and authorizations prior to start of construction of the project. The Company shall notify the appropriate federal, state, and local agencies prior to, during, and/or subsequent to the construction of the project, as identified in the Clearance Package/Permit Book.

1.4 INQUIRIES

Inquiries regarding this E&SCP should be addressed to the ECP Department at the address shown on the front cover. For field conditions requiring an immediate response, contact the designated person responsible at the address shown on the front cover.

2. SUPERVISION AND INSPECTION

To effectively mitigate project-related impacts, the E&SCP must be properly implemented in the field. Quick and appropriate decisions in the field regarding critical issues such as stream and wetland crossings, placement of erosion controls, trench dewatering, spoil containment, and other construction-related items are essential.

To ensure that the E&SCP is properly implemented, at least one Environmental Inspector (EI) will be designated by the Company for each construction spread during active construction or restoration activities. The EI is responsible for verifying environmental compliance on the construction spread, and performing the duties that are outlined in Section 2.1 below.

2.1 ROLE & RESPONSIBILITIES OF THE ENVIRONMENTAL INSPECTOR

EIs will have the authority to stop activities that violate the environmental conditions of the FERC's Orders (if applicable), stipulations of other environmental permits or approvals, or landowner easement agreements, as well as order appropriate corrective action.

The EI will have peer status with all other activity inspectors and will report directly to the Chief Inspector who has overall authority on the construction spread or project.

The number and experience of EIs assigned to each construction spread shall be appropriate for the length of the construction spread and the number/significance of resources affected. On 7(c) and other large construction projects, the person designated as the EI will typically be a dedicated role for each construction spread. On blanket certificate projects and any other small construction activities carried out under this E&SCP, the EI role may be carried out by the Chief Inspector or another designated and properly trained Company Inspector on site, at the discretion of the Company. In such instances, the Company may employ additional periodic oversight of the EI by an environmental specialist.

At a minimum, the EI shall be responsible for:

1. Inspecting construction activities for compliance with the requirements of this E&SCP, the construction drawings, the environmental conditions of the FERC's Orders (if applicable), proposed mitigation measures, other federal or state and local (if applicable) environmental permits and approvals, and environmental requirements in landowner easement agreements;

2. Identifying, documenting, and overseeing corrective actions, as necessary to bring an activity back into compliance;

3. Verifying that the limits of authorized construction work areas and locations of access roads are visibly marked before clearing, and maintained throughout construction;

4. Verifying the location of signs and highly visible flagging marking the boundaries of sensitive resource areas, including waterbodies and wetlands, or areas with special requirements along the construction work area;

5. Identifying erosion/sediment control and soil stabilization needs in all areas;

6. Ensuring that the design of slope breakers will not cause erosion or direct water into sensitive resource areas, including cultural resource sites, wetlands, waterbodies and sensitive species habitats;

7. Verifying that dewatering activities are properly monitored and do not result in the deposition of sand, silt, and/or sediment into sensitive resource areas, including wetlands, waterbodies, cultural resource sites, and sensitive species habitat; stopping dewatering activities if such deposition is occurring and ensuring the design of the discharge is changed to prevent reoccurrence; and verifying that dewatering structures are removed after completion of dewatering activities;

8. Ensuring that subsoil and topsoil are tested in agricultural and residential areas to measure compaction and determine the need for corrective action;

9. Advising the Chief Inspector when environmental conditions (such as wet weather, severe storm events or frozen soils) make it advisable to restrict or delay construction activities to avoid topsoil mixing excessive compaction;

10. Ensuring restoration of contours and topsoil;

11. Verifying that the soils imported for agricultural or residential use have been certified as free of noxious weeds and soil pests, unless otherwise approved by the landowner, and is considered clean and free of hazardous materials;

12. Ensuring that the appropriate erosion/sediment control and stabilization needs are implemented in all areas, including ensuring that erosion and sediment controls are properly installed and maintained daily to prevent sediment flow into sensitive resource areas (e.g., wetlands, waterbodies, cultural resource sites, and sensitive species habitats) and onto roads, and determining the need for additional erosion control devices;

13. Inspecting and ensuring the maintenance of temporary erosion and sediment control measures at least:
    a. On a daily basis in areas of active construction or equipment operation;
    b. On a weekly basis in areas with no construction or equipment operation; and
    c. Within 24 hours of each 0.5 inch of rainfall.

14. Ensuring the repair of all ineffective temporary erosion and sediment control measures within 24 hours of identification, or as soon as conditions allow if compliance with this time frame would result in greater environmental impacts;

15. Identifying areas that should be given special attention to ensure stabilization and restoration after the construction phase;

16. Ensuring proper seed mixes, rates and restoration methods are used, and obtaining documentation;

17. Ensuring that the Contractor implements and complies with the Company's *Spill Prevention, Control and Countermeasure Plan & Preparedness, Prevention and Contingency Plan for Construction Projects* (SPCC/PPC Plan), the Company's *Waste Management Plan*, and other Company environmental documents and standard operating procedures;

18. Verifying that locations for any disposal of excess construction materials for beneficial reuse comply with this E&SCP and any applicable permits / clearances; and,

19. Keeping records of compliance with the environmental conditions of the FERC's Orders and the mitigation measures proposed by the Company in the application submitted to the FERC (if applicable), and other federal or state environmental permits during active construction and restoration. Records should include photo documentation.

2.2 ENVIRONMENTAL TRAINING FOR CONSTRUCTION

Environmental training will be given to both the Company personnel and contractor personnel whose activities have the potential to impact the environment during pipeline construction. All construction personnel from the Chief Inspector, EI, craft inspectors, contractor job superintendent to loggers, welders, equipment operators, and laborers will be given some form of environmental training. The level of training will be commensurate with the type of duties of the personnel. At the discretion of the Company, environmental training for personnel may also be required on projects where it is not required by FERC.

Training will be given prior to the start of construction and throughout the construction process, as needed, and will cover the following issues:

- Specifics of this E&SCP and other Company plans;
- Job or activity specific permit requirements;
- Company policies and commitments;
- Cultural resource procedures and restrictions;
- Threatened and endangered species procedures and restrictions; and
- Any other pertinent information related to the job.

In addition to the EI, all other construction personnel are expected to play an important role in maintaining strict compliance with all permit conditions, and to promptly report any conditions that are perceived as having the potential to threaten environmental protection to the appropriate inspector during construction.

3. CONSTRUCTION TECHNIQUES FOR NATURAL GAS FACILTIES

3.1 TYPICAL ROW REQUIREMENTS

Pipeline construction workspace requirements are a function of pipe diameter, equipment size, topography, geological rock formations, location of construction such as at road crossings or river crossings, pipeline crossovers, methods of construction such as boring or open-cut construction, or existing soil conditions encountered during construction. As the diameter of the pipeline being installed increases, so does the depth of trench, excavated spoil material, equipment size, and ultimately the amount of construction work space that will be required to construct a project. See Figure CW-1 for a detail of a typical trench and Figures CW-3, CW-4 and CW-5 for typical construction ROW widths. All workspace locations for a given project will be shown on the construction drawings.

Additional construction ROW may be required at specific locations including, but not limited to, steep side or vertical slopes, road crossings, pipeline crossovers, areas requiring supplemental topsoil segregation, and staging areas associated with wetland and waterbody crossings. In particular, as shown on the construction drawings, the construction ROW width may be expanded up to 25 feet for the following situations / areas without approval from the FERC, however, prior approval is required from the EI or ECP:

- Accommodate full construction ROW topsoil segregation;
- Ensure safe construction where topographic conditions, such as side-slopes, or soil limitations exist; and
- Facilitate truck turn-arounds where no reasonable alternative access exists in limited, upland, non-riparian or non-forested areas.

All construction activities, including staging areas and additional spoil storage areas, are restricted to the construction ROW limits identified on the construction drawings, except for specific activities in limited, non-wetland and non-riparian areas that are allowed by the FERC Plan and Procedures (i.e. slope breakers, energy-dissipating devices, dewatering structures, and drain tile system repairs). Use of these limited areas is subject to landowner or land management agency approval and compliance with all applicable survey, permit, and reporting requirements; therefore, prior Company approval is required to use these areas. In some cases, federal, state and local permits and authorizations may require additional approvals.

Minor field realignments and workspace shifts per landowner needs and requirements are only allowed if construction activities remain within the environmental field survey area, comply with project-specific environmental permits and landowner easements, and do not affect new landowners or sensitive resource areas.

3.2 ACCESS ROADS & ACCESS POINTS

To the extent practical, all access to the construction ROW will be limited to existing roads and will be minimized in wetlands. However, additional access roads to the construction ROW may be required at various points along the project where other road crossings (paved or gravel state/local roads) do not exist. Examples of types of access used include pipeline ROWs, abandoned town roads, railroad ROWs, power

line service roads, logging roads and farm roads. Improvements to access roads (i.e., grading, placing gravel, replacing/installing culverts, and trimming overhanging vegetation) may be required due to the size and nature of the equipment that would utilize the road (Figure RD-1). The following conditions apply to the use of all access roads:

1. During construction and restoration activities, access to the ROW is limited to the use of new or existing access roads identified on the construction drawings.

2. The only access roads that can be used in wetlands, other than the construction ROW, are those existing roads requiring no modification or improvements, other than routine repair, and posing no impact on the wetland.

3. The construction ROW may be used for access across wetlands when the wetland soil is firm enough to avoid rutting or the construction ROW has been appropriately stabilized to avoid rutting (e.g., with timber riprap, prefabricated equipment mats, or terra mats). However, access is not allowed through wetlands that are specifically being avoided by HDD or would not otherwise be impacted by the project.

4. In wetlands that cannot be appropriately stabilized, all construction equipment other than that needed to install the wetland crossing shall use access roads located in upland areas. Where access roads in upland areas do not provide reasonable access, limit all other construction equipment to one pass through the wetland using the construction ROW.

5. Blanket certificate projects may not have construction drawings available in which case access to the ROW will be identified in the Clearance Package / Permit Book.

6. Maintain safe and accessible conditions at all road crossings and access points during construction and restoration. Access road maintenance through the construction sequence may include grading and the addition of gravel or stone when necessary.

7. Maintain access roads in a stable manner to prevent off-ROW impacts, including impacts to adjacent and/or nearby sensitive resource areas, and implement all appropriate erosion and sediment control measures for construction/improvement of access roads.

8. Minimize the use of tracked equipment on public roadways.

9. Remove any soil or gravel spilled or tracked onto roadways daily or more frequent as necessary to maintain safe road conditions.

10. Repair any damages to roadway surfaces, shoulders, and bar ditches.

11. If crushed stone/rock access pads are used in residential or agricultural areas, stone shall be placed on synthetic, nonwoven geotextile fabric to facilitate removal after construction (Figure RD-2).

12. All access roads across a waterbody must use an equipment bridge in accordance with Section 5.1.2.

13. For access through a saturated wetland, use timber mats or an equivalent, unless otherwise authorized by agency permits (Figure RD-3).

14. Limit construction equipment operating in wetland areas to that needed to clear the ROW, dig the trench, fabricate and install the pipeline, backfill the trench, and restore the construction ROW. All other construction equipment shall use access roads located in upland areas to the maximum extent practical.

3.3 PIPE AND CONTRACTOR WAREYARDS

Pipe and contractor wareyards are required for storing and staging equipment, pipe, fuel, oil, pipe fabrication, and other construction-related materials and preparations. The Contractor shall perform the following measures at pipe and contractor wareyards:

1. Strip and segregate topsoil in agricultural lands;
2. Install erosion and sediment control structures as directed by the EI or identified on the construction drawings, and as outlined in this E&SCP and the SPCC/PPC Plan. Maintain controls throughout construction and restoration activities;
3. Implement and comply with the SPCC/PPC Plan and the Waste Management Plan, including the completion of any required site-specific forms and attachments; and,
4. Restore and revegetate all disturbed areas in accordance with the measures outlined in this E&SCP, landowner agreements and/or as directed by the EI. At a minimum, the area must be returned to preconstruction contours and stabilized prior to contractor demobilization.

3.4 OFF-ROW DISTURBANCE

All construction activities are restricted to the construction ROW limits identified on the construction drawings, except for specific activities in limited, non-wetland and non-riparian areas that are allowed by the FERC Plan and Procedures. Activities allowed to occur off-ROW are limited to the installation of slope breakers, energy-dissipating devices and dewatering structures, as well as repairs to drain tile. Minor field realignment and workspace shifts per landowner needs and requirements are only allowed if construction activities remain within the environmental field survey area, maintain compliance with project-specific environmental permits and landowner easements, do not affect new landowners or environmental resources, and do not require the operation of heavy equipment off ROW. In the event that inadvertent off-ROW disturbance occurs, the following measures will be implemented:

1. The EI will immediately report the occurrence to the Chief Inspector and ROW Agent;
2. The conditions that caused the disturbance will be evaluated by the Chief Inspector and the EI, and they will determine whether work at the location can proceed under those conditions; and
3. If determined to be necessary by the Chief Inspector and EI, one or more of the following corrective actions will be taken: immediate restoration of the preconstruction contours, seeding and mulching of the disturbed area, and/or installation of erosion or sediment control devices, conduct additional tailgate or employee/contractor training, and investigation of the issue to develop lessons learned for future issue prevention.

4. The Company's ECP Department will be notified.

3.5 CONSTRUCTION SEQUENCE FOR PIPELINE INSTALLATION

Natural gas pipelines are installed using conventional overland buried pipeline construction techniques. These activities are necessary for the installation of a stable, safe, and reliable transmission facility consistent with U.S. Department of Transportation (U.S.DOT) requirements and regulations. This section provides an overview of the equipment and operations necessary for the installation of a natural gas pipeline, describes potential impacts that may occur from each operation, and identifies the measures that will be implemented to control these potential impacts. This section also discusses in detail the erosion and sediment control techniques that typically apply to each construction activity including clearing, grading, trenching, lowering-in of pipe, backfilling, and hydrostatic testing. Pipe abandonment in-place or removal, which may be associated with a pipeline replacement activity or occur as an independent activity on an existing pipeline, are also covered at the end of this section. ROW restoration is the final step in the typical construction sequence and will be addressed in Section 3.6.

Installation of the pipeline typically proceeds in a linear manner from one end of the construction spread to the other in an assembly line or "mainline" fashion. However, different stages may be running in parallel on different physical segments of the project. In some cases, this means that full completion of one of the construction sequence stages described below may not occur before the next construction sequence stage is initiated. Construction sequencing should be planned to limit the amount and duration of open trench sections, as necessary, to prevent excessive erosion or sediment flow into sensitive environmental resource areas. This is due to the Company's effort to adhere to strict construction schedules in order to minimize safety concerns, landowner effects, and environmental disturbance. The spacing between the individual crews responsible for each interdependent activity is based on anticipated rate of linear progress. The activities listed below are typically performed in the following sequence:

- Surveying and flagging the ROW;
- Clearing the ROW;
- Installing temporary sediment barriers;
- Grading the ROW;
- Installing temporary slope breakers;
- Trenching/excavating the trench;
- Pipe stringing and bending;
- Welding and weld inspection;
- Lowering the pipe into the trench;
- Backfilling the trench;
- Hydrostatic testing of pipe; and
- ROW restoration and clean-up.

Obstacles to the mainline technique are often encountered and are not considered to be out of the ordinary. These obstacles, which include side hill crossings, rock, wetlands, streams, roads and residential areas, do not normally interrupt the assembly line flow.

3.5.1 Clearing & Flagging

Clearing operations include the removal of vegetation within the construction ROW. Various clearing methods are employed depending on tree size, contour of the land, and the ability of the ground to support clearing equipment. Vegetative clearing can be accomplished either by hand or by cutting equipment. The following procedures will be standard practice during clearing:

1. Prior to beginning the removal of vegetation,
    a. The limits of clearing will be established and visibly marked before clearing;
    b. Signs and highly visible flagging will also be used to mark the boundaries of sensitive resource areas, including waterbodies and wetlands, and/or areas with special requirements along the construction work area, in accordance with the construction drawings;
    c. Flagging or marking shall be maintained throughout construction;
    d. Trees to be protected per landowner requests or as otherwise directed will be clearly marked;
2. All construction activities and ground disturbance will be confined to within the construction ROW shown on the construction drawings (with the limited exception of compliance activities described above in Section 3.4);
3. All brush and trees will be felled into the construction ROW to minimize damage to trees and structures adjacent to the ROW. Trees that inadvertently fall beyond the edge of the ROW will be immediately moved onto the ROW and disturbed areas will be immediately stabilized, per landowner approval;
4. Trees will be chipped and removed or cut into lengths identified by the landowner and then stacked at the edge of the ROW or removed. Trees may be burned depending on local and state restrictions, applicable permits, construction Line List stipulations, and landowner agreements;
5. Brush and limbs may be disposed of in one or more of the following ways depending on local restrictions, applicable permits, construction Line List stipulations, and landowner agreements:
    a. Stockpiled along the edge of the ROW;
    b. Burned;
    c. Chipped, spread across the ROW in upland areas, and plowed in at the discretion of the Chief Inspector or EI (excess material must be removed);
    d. Used as part of erosion control mix material; or
    e. Hauled off site to a Company-approved location.
6. Existing surface drainage patterns shall not be altered by the placement of timber or brush piles at the edge of the construction ROW.

3.5.2 Temporary Sediment Barriers

Sediment barriers, which are temporary sediment controls intended to minimize the flow and deposition of sediment beyond approved workspaces or into sensitive resource areas, shall be installed following vegetative clearing operations. They may be constructed of materials such as silt fence, staked straw bales, compacted earth (e.g., drivable berms across travel lanes), sand bags, or other appropriate materials (Figures EC-1, EC-2, EC-3 and EC-5). Where allowed by regulatory agencies, hay bales may be used in lieu of straw bales with the following restrictions**:** hay bales shall not be used for mulching and the Contractor is responsible for their removal and disposal.

1. Install temporary sediment barriers at the base of slopes greater than 5% where the base of the slope is less than 50 feet from a road crossing, waterbody and/or wetland in accordance with Sections 5.1.4 and 6.3 respectively.
2. Do not stake or trench in place straw bales used on equipment bridges or on mats across the travel lane.
3. Inspect temporary sediment barriers daily in areas of active construction to ensure proper functioning and maintenance. In other areas with no construction or equipment operation, sediment barriers will be inspected and maintained on a weekly basis throughout construction, and within 24 hours of each 0.5 inch of rainfall. Conduct an inspection within 24 hours once a storm event has produced 0.5 inch of rainfall, even if the storm event is still continuing.
4. Maintain all temporary sediment barriers in place until permanent revegetation measures are successful or the upland areas adjacent to wetlands, waterbodies, or roads are stabilized.
5. Remove temporary sediment barriers from an area when replaced by permanent erosion or sediment control measures or when the area has been successfully restored as specified in Section 8.1.

3.5.3 Grading

The construction ROW will be graded as needed to provide a level workspace for safe operation of heavy equipment used in pipeline construction. The following procedures will be standard practice during grading:

3.5.3.1 Topsoil Segregation

During construction, topsoil and subsoil will be disturbed by grading of the right-of-way, trench excavation, and by heavy equipment moving along the right-of-way. Implementation of proper topsoil segregation is intended to mitigate these construction impacts and promote or facilitate post-construction revegetation success.

Topsoil segregation methods will be used in all residential areas (except where the topsoil is being replaced), wetlands (except areas where standing water is present or soils are saturated), cultivated or rotated croplands, managed pastures, hayfields, and other areas at the landowner's or land managing agency's request. Either the "ditch plus spoil side" or the "full right-of-way" segregation method will be used, as illustrated in Figure CW-2.

a. Prevent the mixing of topsoil with subsoil by stripping topsoil from either the full work area or from the trench and subsoil storage area ("ditch plus spoil side" method) as stipulated in the Construction Contract or Line List.

b. Segregate at least 12 inches of topsoil in deep soils with more than 12 inches of topsoil. In soils with less than 12 inches of topsoil, make every effort to segregate the entire topsoil layer.

c. Within wetlands, segregate the top 12 inches of topsoil within the trenchline, except in areas where standing water is present or soils are saturated.

d. In residential areas, importation of topsoil (i.e. topsoil replacement) is an acceptable alternative to topsoil segregation, if approved by the landowner and Chief Inspector.

e. Maintain separation of salvaged topsoil and subsoil throughout all construction activities.

f. Leave gaps in the topsoil piles and spoil piles for the installation of temporary slope breakers to allow water to be diverted off the construction ROW.

g. Never use topsoil for padding the pipe, constructing temporary slope breakers, trench breakers or trench plugs, improving or maintaining roads, or as a fill material.

h. Stabilize topsoil piles and minimize loss due to wind and water erosion with use of sediment barriers, mulch, temporary seeding, tackifiers, or functional equivalents, where necessary.

3.5.3.2 Tree Stump Removal and Disposal

a. Remove tree stumps in upland areas along the entire width of the permanent ROW to allow adequate clearance for the safe operation of vehicles and equipment. Stumps within the temporary ROW will be removed or ground below the surface in accordance with Company construction specifications to allow the safe passage of equipment, as determined by the Chief Inspector or EI.

b. In wetlands, limit pulling of tree stumps and grading activities to directly over the trenchline.

c. Dispose of stumps by one of the following methods with the approval of the Chief Inspector and the landowner and in accordance with regulatory requirements:

- Buried at a Company-approved off-site location (except in wetlands and agricultural areas);
- Burned on construction ROW;
- Chipped, spread across the construction ROW in upland areas, and plowed in;
- Used as erosion control mix material;

- Ground to grade in wetlands, excess chips will be removed for proper disposal; or
- Hauled off-site.

d. Grading operations and tree stump removal in wetland areas will be conducted in accordance with Section 6.2.

3.5.3.3 Rock Management

Rock, including blast rock, will be used, removed or disposed of in one of the following ways:

a. Rock excavated from the trench may be used to backfill the trench only to the top of the existing bedrock profile. (Rock that is not returned to the trench shall be considered construction material or waste, unless approved for use as mulch or for some other use on the construction work areas by the land owner or land managing agency.);

b. Windrowed per written landowner agreement with the Company;

c. Removed and disposed of at a Company-approved landfill; or

d. Used as riprap for streambank stabilization as allowed by applicable regulatory agency(ies) and provided the rock is uncontaminated and free of soil and other debris (Figure WC-6).

3.5.4 Temporary Slope Breakers

Temporary slope breakers, also called interceptor dikes, are temporary erosion control measures intended to reduce runoff velocity and divert water off the construction ROW. Temporary slope breakers may be constructed of materials such as compacted soil, silt fence, staked straw bales, or sand bags. Segregated topsoil may not be used for constructing temporary slope breakers. If permitted by regulatory agency(ies), hay bales may be used in lieu of straw bales except for mulching. If hay bales are used, the Contractor is responsible for their removal and Company-approved disposal.

1. Install temporary slope breakers on all disturbed areas as necessary following grading operations (Figure EC-7) to avoid excessive erosion. Unless otherwise specified by permit conditions, temporary slope breakers must be installed on slopes greater than 5% at the recommended spacing interval indicated below (Closer spacing should be used if necessary):

Slope (%)	**Spacing (feet)**
< 5	No structure
5 – 15	300
> 15 – 30	200
> 30	100

2. Direct the outfall of each slope breaker to a stable, well vegetated area or construct an energy-dissipating device (silt fence, staked straw bales, erosion control fabric) at the end of the slope breaker.

3. Position the outfall of each temporary slope breaker to prevent sediment discharge into wetlands, waterbodies, or other sensitive resource areas.

4. Install temporary slope breakers across the entire construction ROW along slopes greater than 5 % where the base of the slope is less than 50 feet from waterbody, wetland, and road crossings.

5. Inspect temporary slope breakers daily in areas of active construction to insure proper functioning and maintenance. In other areas, the slope breakers will be inspected and maintained on a weekly basis throughout construction, and within 24 hours of each 0.5 inch of rainfall. Repairs should be made within 24 hours of identification, if possible.

Drivable berms, which are smaller versions of slope breakers constructed of compacted soil or sand bags, may be used in place of staked straw bales at the entrances and exits of travel lanes at road crossings, waterbodies, and wetlands. They are installed across the width of the travel lane at the start of the equipment crossing and made low enough to allow equipment and other vehicles to pass. Yet, they should function to reduce and divert water runoff from sensitive resource areas.

3.5.5 Trenching

The trench centerline will be staked after the construction ROW has been prepared. In general, a trench will be excavated to a depth that will permit burial of the pipe with a minimum of 3 feet of cover (Figure CW-1). Overland trenching may be accomplished using a conventional backhoe or a rotary wheel-ditching machine. In shale or rocky areas where the use of the conventional excavation equipment is limited, a tractor-drawn ripper or rock hammer may be employed to break and loosen hard substratum material. In areas where rock cannot be ripped or hammered, drilling and blasting may be required. A backhoe may then be used to remove rock and soil from the ditch.

The following procedures will be standard practice during ditching:

- Flag drainage tiles damaged during ditching activities for repair;
- Place spoil in additional extra work areas or at least 10 feet away from the waterbody's edge in the construction ROW. Spoil will be contained with erosion and sediment control devices to prevent spoil materials or sediment-laden water from transferring into waterbodies and wetlands or off of the ROW; and,
- If temporary erosion or sediment controls are damaged or removed during trenching, they shall be repaired and/or replaced before the end of the work day.

3.5.5.1 Temporary Trench Plugs

Temporary trench plugs are barriers within the ditch that are intended to segment the continuous open trench prior to backfill. They typically consist of unexcavated portions of the ditch (hard plug), compacted subsoil or sandbags (soft plug) placed across the ditch, or some functional equivalent. Along steep slopes, they serve to reduce erosion and sedimentation in the trench and minimize dewatering problems at the base of slopes where sensitive environments such as waterbodies and wetlands are frequently located. In addition, they provide access across the trench for wildlife and livestock.

a. Do not use topsoil for constructing trench plugs.

b. Coordinate with the landowner to identify optimal locations for the placement of temporary hard plugs designed to provide access for livestock.

c. Temporary trench plugs may be used in conjunction with slope breakers to prevent water in the trench from overflowing into sensitive resource areas (Figure EC-6). Attempt to divert trench overflow to a well-vegetated off-ROW location or construct an energy-dissipating device.

d. Position temporary trench plugs, as necessary, to reduce trenchline erosion and minimize the volume and velocity of trench water flow at the base of slopes.

3.5.6 Trench & Site Dewatering

Dewatering may be periodically conducted to remove accumulated groundwater or precipitation from the construction ROW, including from within the trenchline. The need for erosion controls as well as the type of control used will vary depending on the type and amount of sediment within the water, and volume and rate of discharge.

1. Conduct dewatering (on or off the construction ROW) in such a manner that does not cause erosion and does not result in silt-laden water flowing into any waterbody or wetland.
2. Elevate and screen the intake of each hose used to withdraw the water from the trench to minimize pumping of deposited sediments.
3. Water may be discharged into areas where adequate vegetation is present adjacent to the construction ROW to function as a filter medium.
4. Where vegetation is absent or in the vicinity of waterbody / wetland areas, water will be pumped into a discharge structure that accommodates the anticipated discharge volumes as well as type and amount of sediment within the water being discharged, including
    a. a filter bag, as illustrated in Figure WD-1, or
    b. a structure composed of sediment barriers (Options for these types of controls are illustrated in Figure WD-2 and WD-3.).

    A structure that is more typically used for discharges of hydrostatic test water, as illustrated in Figure WD-2, may be necessary for large volumes of water.
5. When using filter bags, secure the discharge hose to the bag with a clamp.
6. Remove dewatering structures as soon as practicable after the completion of dewatering activities.

3.5.7 Pipe Installation

During all phases of the pipe installation process, ensure that all roadway crossings and access points are safe and accessible conditions. Repair damaged temporary erosion controls by the end of the work day. If portions of slope breakers are removed from the travel lane to facilitate safe work conditions, they shall be restored prior to the end of the work day.

3.5.7.1 Stringing and Bending

Following trench excavation, pipe sections will be delivered to the construction site by truck or tracked vehicle, and strung out along the trench. Individual pipe sections will be placed on temporary supports or wooden skids and staggered to allow room for work on the exposed ends. Certain pipe sections will be bent, as necessary, to conform to changes in slope and direction of the trench.

All rope bands should be collected and disposed of properly.

3.5.7.2 Welding

Once the bending operation is complete, the pipe sections will be welded together on supports using approved welding procedures that comply with Company welding specifications. After welding, the welds will be inspected radiographically or ultrasonically to ensure their structural integrity.

3.5.7.3 Lowering-in and Tie-ins

Lowering-in consists of placing the completed pipeline sections into the trench typically using two or more sideboom tractors acting in unison and spaced so as not to buckle or otherwise damage the pipe. The pipeline will be lifted from the supports, swung out over the trench, and lowered directly into the trench. The equipment uses a “leap frogging” technique requiring sufficient area to safely move around other tractors within the construction ROW to gain an advanced position on the pipe. The unwelded ends of the completed pipeline segments (typically present at road crossings, stream crossings, etc.) are then welded together or “tied-in” by specialized tie-in crews.

3.5.8 Backfilling

Backfilling consists of covering the pipe with the earth removed from the trench or with other fill material hauled to the site when the existing trench spoil is not adequate for backfill. Backfilling will follow lowering-in of the pipeline as close as is practical.

In areas where the trench bottom is irregularly shaped due to consolidated rock or where the excavated spoil materials are unacceptable for backfilling around the pipe, padding material may be required to prevent damage to the pipe. This padding material will generally consist of sand or screened spoil materials from trench excavation.

1. Under no circumstances shall topsoil be used as padding material.

2. Excess rock, including blast rock, may be used to backfill the trench only to the top of the existing bedrock profile in accordance with Company specifications. Rock that is not used to backfill the trench will be managed as described in Section 3.5.3.3.

3. Any excess material will be spread within the ROW in upland areas and land contours will be roughed-in to match adjacent topography.

4. The trench may be backfilled with a crown over the pipe to compensate for compaction and settling. Openings will be left in the completed trench crown to restore pre-construction drainage patterns. Crowning shall not be used in wetland areas.

3.5.8.1 Permanent Trench Breakers

Permanent trench breakers are intended to slow subsurface water flow and erosion along the trench and around the pipe in sloping terrain. An engineer or similarly qualified professional shall determine the need for and spacing of permanent trench breakers. However, trench breakers will not be installed within a wetland.

Permanent trench breakers will be constructed with sand bags, polyurethane foam, or an equivalent as identified in the permit requirements (Figure EC-10 and EC-11). Topsoil shall not be used to construct trench breakers. Sakrete may be used at the discretion of the Chief Inspector on severe slopes greater than 30 percent.

Permanent trench breakers, which are used in conjunction with slope breakers, shall be installed at the locations shown on the construction drawings, at the same spacing interval as and upslope of permanent slope breakers, or as otherwise determined by an engineer or similarly qualified professional, such as the EI (Figure EC-12). At a minimum, install trench breakers:

a. At the base of slopes greater than 5% where the base of the slope is less than 50 feet from a waterbody or wetland;

b. Where needed to avoid draining of a resource, including at wetland boundaries where the pipeline trench may drain a wetland, and/or seal the trench bottom as necessary to maintain the original wetland hydrology; and,

c. In agricultural fields and residential areas where slope breakers are not typically required, install trench breakers at the same spacing as if permanent slope breakers were required.

3.5.9 Hydrostatic Testing

Once the pipeline is completed and before it is placed into service, it will be hydrostatically tested for structural integrity. Hydrostatic testing involves filling the pipeline with clean water and maintaining a test pressure in excess of normal operating pressures for a specified period of time (typically 8 hours). The testing procedure involves filling the pipeline with water, performing the pressure test, and discharging the test water.

The following general hydrostatic testing procedures shall be adhered to for all projects. Environmental conditions for hydrostatic testing activities are also addressed in the project-specific Hydrostatic Test Clearance Package that is issued by ECP if permits are required for water appropriation and/or discharge. During planning and permitting of test events:

1. Identify the location of all waterbodies proposed for use as a hydrostatic test water source or discharge location. Use only the water sources identified in the Clearance Package/Permit Book.

a. Do not use water from or discharge into state-designated exceptional value waters, waterbodies that provide habitat for federally listed threatened or endangered species, or waterbodies designated as public water supplies, unless appropriate federal, state, and/or local permitting agencies grant written permission.

2. Locate hydrostatic test manifolds outside wetlands and riparian areas to the maximum extent practicable.
3. Attempt to locate discharge sites in a well-vegetated and stabilized area, if practical, at least 50-feet from adjacent waterbody/wetland areas.
4. Apply for and obtain state-issued water withdrawal permits and National Pollutant Discharge Elimination System (NPDES) or state-issued discharge permits, as required.

During preparation for testing, including appropriation of source water and preparing discharge/outfall site:

1. At least 48 hours before testing activities, the EI shall notify appropriate state agencies (as identified in the relevant permit for hydrostatic test discharges) of the intent to use specific test water sources (unless waived in writing).
2. If pumps used for hydrostatic testing are within 100 feet of any waterbody or wetland, the use of secondary containment, operation and refueling of those pumps will be addressed and conducted in accordance with the SPCC/PPC Plan.
3. Screen the intake hose to minimize the potential for entrainment of fish and other aquatic life.
4. Maintain adequate flow rates to protect aquatic life, provide for all waterbody uses, and provide for downstream withdrawals of water by existing users.
5. Install all discharge structures in a well-vegetated and stabilized area, if practical, and attempt to maintain at least a 50-foot vegetated buffer from adjacent waterbody/wetland areas. If an adequate buffer is not available, sediment barriers or similar sediment control measure must be installed.

During the discharge of hydrostatic test water on-site:

1. Discharge water only at the locations shown on the construction drawings or locations identified in the Clearance Package/Permit Book or ECP's Hydrostatic Test Clearance Package.
2. Regulate rate of discharge water and use energy dissipation device(s) and sediment barriers, as necessary, to prevent erosion, streambed scour to aquatic resources, sedimentation, flooding or excessive stream flow (Figures WD-2 and WD-3).
3. Use absorbent booms as necessary during discharge from existing pipe or as stipulated by the applicable NPDES permit.
4. The test water may be discharged through an appropriate filtration system including holding tanks or frac tanks and/or carbon filters if needed to meet effluent limitations or conditions stipulated in the NPDES permit.

5. Do not discharge into state-designated exceptional value waters, waterbodies which provide habitat for federally listed threatened or endangered species, or waterbodies designated as public water supplies, unless appropriate federal, state, and local permitting agencies grant written permission.

6. The EI or appropriate designee shall sample and test the source water and discharge water in accordance with the permit requirements.

3.5.10 Pipeline Abandonment and Removal

Pipeline abandonment and removal activities may occur when gas service is no longer needed, such as the abandonment of a lateral to a customer receipt or delivery point. Removal or in-place abandonment of pipe can also be conducted as part of an expansion or maintenance project, such as the lift-and-relay of existing pipe, the replacement or relocation of an existing pipeline due to road or highway modifications, or activities required to maintain compliance with U.S.DOT requirements.

Abandonment approval from FERC, such as project-specific Section 7(b) Order or blanket certificate authorization, is required prior to abandoning facilities or services. Abandonment of FERC-regulated natural gas pipelines or storage facilities, either in place or by removal, must follow FERC's regulations.

Where removal of a section of existing pipeline is required, construction activities typically proceed in a construction sequence similar to what has been described above in Section 3.5, except that instead of the pipeline installation step, the existing pipeline would be cut and removed from the trench. If the pipeline removal is associated with a lift-and-relay project or a replacement, then the new pipeline installation would follow the removal of the old pipe. Pipe that is abandoned by removal will be handled, taken off-site and properly disposed of or recycled in accordance with Company procedures.

When a pipeline is abandoned in place, typically work involves only relatively small excavations to remove above-ground appurtenances and meters, as well as expose the pipe in certain locations, cut it, fill with grout or blanket gas and cap the ends of the pipe, in accordance with agency and Company requirements.

Mitigation measures for pipeline abandonment and removal activities, such as erosion control measures, will follow the same requirements outlined within the E&SCP for pipeline installation in order to minimize erosion and enhance revegetation, as well as mitigate the extent and duration of project-related disturbance to wetlands and waterbodies.

3.6 ROW RESTORATION & FINAL CLEANUP

Restoration of the ROW will begin after pipeline construction activities have been completed. Restoration measures include the re-establishment of final grades and drainage patterns as well as the installation of permanent erosion and sediment control devices to minimize post-construction erosion. Residential areas will be restored in accordance with Section 4.3.3. Property shall be restored as close to its preconstruction condition as practical unless otherwise specified by the landowner.

1. The Contractor shall make every reasonable effort to complete final cleanup of an area (including final grading, topsoil replacement and installation of permanent erosion control structures) within 20 days after backfilling the trench in that area (within 10 days in residential areas). If seasonal or other weather conditions prevent compliance with these timeframes, continue to inspect and maintain temporary erosion and sediment controls (i.e. temporary slope breakers, sediment barriers, and mulch) until conditions allow completion of cleanup. If construction or restoration unexpectedly continues into the winter season, follow the requirements of Frozen Conditions & Winter Construction, Section 3.6.4.

2. Seed all disturbed soils within 6 working days of final grading, weather and soil conditions permitting.

3. If construction or restoration unexpectedly cannot be completed and is delayed until the next recommended growing season, the winter stabilization measures shall be followed.

4. Grade the ROW to pre-construction contours, with the exception of the installation of any permanent measures required herein.

5. Spread segregated topsoil back across the graded ROW to its original profile.

6. Remove excess rock from at least the top 12 inches of soil in all cultivated or rotated cropland, managed pastures, hayfields, residential areas, as well as other areas at the landowner's request. The size, density, and distribution of rock on the construction ROW shall be similar to adjacent areas not disturbed by construction. The landowner or land managing agency may approve other provisions in writing.

7. A travel lane may be left open temporarily to allow access by construction traffic if the temporary erosion and sediment control structures are installed, regularly inspected and maintained. When access is no longer required, the travel lane must be removed and the ROW restored.

8. Remove all construction debris (used filter bags, skids, trash, etc.) from all construction work areas unless the landowner or land managing agency approves leaving material onsite for beneficial reuse, stabilization, or habitat restoration. Grade or till the ROW to leave the soil in the proper condition for planting.

3.6.1 Permanent Erosion Control

3.6.1.1 Permanent Slope Breakers

Permanent slope breakers are intended to reduce runoff velocity, divert water off the construction ROW, and prevent sediment deposition into sensitive resources. Permanent slope breakers will be constructed of compacted soil (Figure EC-8). Stone or some functional equivalent may be used when approved by the Company.

a. Construct and maintain permanent slope breakers in all areas, except cultivated areas and lawns, unless requested by the landowner, at the locations shown on the construction drawings.

b. Use spacing recommendations obtained from the local soil conservation authority or land managing agency. If not shown on the construction drawings or in the absence of written recommendations, use the following spacing (same as temporary slope breaker spacing) unless closer spacing is necessary to avoid excessive erosion on the construction ROW:

Slope (%)	Spacing (feet)
< 5	No structure
5 – 15	300
> 15 – 30	200
> 30	100

c. A permanent trench breaker will be located immediately upslope of the slope breaker.

d. Install permanent slope breakers across the construction ROW at the base of slopes adjacent to roads. When the ROW parallels an existing utility ROW, permanent slope breakers may be installed to match existing slope breakers on the adjacent undisturbed utility ROW.

e. Install permanent slope breakers across the construction ROW at the base of slopes greater than 5% that are less than 50 feet from a wetland or waterbody, or as needed to prevent sediment transport into a wetland or waterbody.

f. Construct slope breakers with a 2 to 8 percent outslope to divert surface flow to a stable vegetative area without causing water to pool or erode behind the slope breaker. In the absence of a stable vegetative area, install an energy-dissipating device at the end of the slope breaker.

g. Slope breakers may extend slightly (about 4 feet) beyond the edge of the construction ROW to effectively drain water off the disturbed area. Where slope breakers extend beyond the edge of the construction ROW, they are subject to compliance with all applicable survey and permit requirements.

h. Install chevron-style slope breakers on slopes as appropriate (Figure EC-9).

i. Where drainage is insufficient in upland areas, install a rock-lined drainage swale as approved by the EI. The drainage swale is generally 8 feet wide and a maximum of 18-24 inches deep (Figure EC-4).

3.6.1.2 Erosion Control Fabric / Blankets

Erosion control fabric or blankets are used during restoration, including as mulch, to slow down stormwater and stabilize soil until vegetation becomes established. Examples of these erosion controls include jute thatching or bonded fiber blankets. Do not use synthetic monofilament mesh/netted erosion control materials in areas designated as

sensitive wildlife habitat, unless the product is specifically designed to minimize harm to wildlife.

Install erosion control fabric or blankets where necessary or as recommended by the EI

a. at slope breaker outlets and drainage swales (Figure EC-7, EC-8 and EC-4);

b. on slopes adjacent to roads or waterbodies (Figure EC-14); and

c. on waterbody banks at the time of final bank recontouring (Figure WC-5).

Anchor the erosion control fabric or blanket with staples or other appropriate devices in accordance with the manufacturers' recommendations (Figure EC-13). Evaluate flow conditions to determine if erosion control fabric is suitable as an effective vegetation stabilization technique on waterbody banks. High-velocity erosion control fabric should be used on the swale side of permanent slope breakers.

3.6.2 Revegetation and Seeding

Successful revegetation of soils disturbed by project-related activities is essential. Seeding will be conducted using the following requirements:

1. Fertilize and add soil pH modifiers in accordance with the recommendations in Appendix C. Incorporate recommended soil pH modifier and fertilizer into the top 2 inches of soil as soon as practicable after application;

2. Seed all disturbed areas within 6 working days of final grading, weather and soil conditions permitting;

3. Prepare seedbed in disturbed areas to a depth of 3 to 4 inches to provide a firm seedbed. When hydroseeding, scarify the seedbed to facilitate lodging and germination of seed;

4. Seed disturbed areas in accordance with the seed mixes, rates, and dates in Appendix C, except in upland areas where landowners or a land management agency may request alternative seed mixes, however, seeding is not required in cultivated croplands unless requested by the landowner;

5. Perform seeding of permanent vegetation within the recommended seeding dates as outlined in Appendix C. If seeding cannot be done within those dates, use appropriate temporary erosion control measures discussed in Section 3.5.2 and perform seeding of permanent vegetation at the beginning of the next recommended seeding season. Dormant seeding or temporary seeding of annual species may also be used, if necessary, to establish cover, as approved by the EI. Mulch in accordance with Section 3.6.3. Lawns may be seeded on a schedule established with the landowner;

6. Base seeding rates on Pure Live Seed (PLS);

7. Use seed within 12 months of seed testing;

8. Treat legume seed with an inoculant specific to the species using the manufacturer's recommended rate of inoculant appropriate for the seeding method (broadcast, drill, or hydroseeding); and,

9. Uniformly apply and cover seed in accordance with the appropriate seed mix from Appendix C, in the absence of any recommendations from the local soil conservation authorities, landowner, or land managing agency to the contrary.

    a. A seed drill equipped with a cultipacker is preferred for application but, where permitted by regulatory agencies, broadcast or hydroseeding can be used at double the recommended seeding rates.

    b. Where seed is broadcast, firm the seedbed with a cultipacker or roller after seeding.

    c. In rocky soils, or where site conditions may limit the effectiveness of this equipment, other alternatives may be appropriate (e.g., use of a chain drag) to lightly cover seed after application, as approved by the EI.

3.6.3 Mulch

Mulch is intended to stabilize the soil surface and shall consist of weed-free straw, wood fiber hydromulch, erosion control fabric or some functional equivalent as approved by the EI and Chief Inspector.

1. Mulch all disturbed upland areas (except cultivated cropland) **before** seeding if:

    a. Final cleanup, including final grading and installation of permanent erosion control measures, is not completed in an area within 20 days after the trench in that area is backfilled (10 days in residential areas); or

    b. Construction or restoration activity is interrupted for extended periods, such as when seeding cannot be completed due to seeding period restrictions.

    NOTE: When mulching before seeding, increase mulch application on all slopes within 100 feet of waterbodies and wetlands to a rate of 3 tons/acre of straw or equivalent.

2. Apply mulch on all slopes (except in cultivated cropland) concurrent with or immediately after seeding, where necessary, to stabilize the soil surface and to reduce wind and water erosion. Spread mulch uniformly over the ROW at a rate of 2 tons/acre of straw or equivalent.

3. Mulch with woodchips only under the following conditions with prior approval from the Chief Inspector or the EI:

    a. Do not use more than 1 ton/acre; and

    b. Add the equivalent of 11 lbs/acre available nitrogen (at least 50% of which is slow release).

4. Ensure that mulch is anchored to minimize loss by wind and water. Anchoring may be achieved by wet soil conditions, when approved by the EI, mechanical means, or use of liquid mulch binders.

5. When anchoring with liquid mulch binders, use rates recommended by the manufacturer. Do not use liquid mulch binders within 100 feet of wetlands and waterbodies, except where the product is certified environmentally non-toxic by the appropriate state or federal agency or independent standards-setting organization.

6. If used, install erosion control fabric or blankets in accordance with Section 3.6.1.2.

3.6.4 Frozen Conditions & Winter Construction

Winter weather may not provide suitable conditions for soil handling or restoration of disturbed areas. In the event that the construction occurs too late in the year for cleanup activities to adequately proceed or if construction is planned to occur during winter weather conditions, the Company will develop a project-specific Winter Construction Plan that addresses:

- Winter construction procedures (e.g., snow handling and removal, access road construction and maintenance, soil handling under saturated or frozen conditions, topsoil stripping);
- Stabilization and monitoring procedures if ground conditions will delay restoration until the following spring (e.g., mulching and erosion controls, inspection and reporting, stormwater control during spring thaw conditions); and,
- Final restoration procedures (e.g., subsidence and compaction repair, topsoil replacement, seeding).

The Winter Construction Plan will be provided within the project-specific Clearance Package / Permit Book. Section 7(c) and prior notice projects are required to file the Winter Construction Plan for the review and written approval by the FERC. (The requirement to file a plan does not apply to projects constructed under the automatic authorization provisions in the FERC's regulations.)

3.6.5 Unauthorized Vehicle Access to ROW

The Company will offer to install and maintain measures to control unauthorized vehicle access to the ROW based on requests by the manager or owner of forested lands. These measures may include:

- Signs;
- Fences with locking gates;
- Permanent access roads;
- Slash and timber barriers, pipe barriers, or a line of boulders across the ROW; or
- Conifers or other appropriate shrubs with a mature height of 4 feet or less across the ROW.

3.7 ABOVEGROUND FACILITY CONSTRUCTION

Construction at aboveground facilities, including compressor stations, meter stations, valve sites, and other facilities, will follow the same best management practices identified for pipeline installation and removal on

the ROW. Work activities in this category can include installation of new aboveground facilities, modification or relocation of facilities at existing compressor station sites, upgrades or installations at existing meter station sites, construction of new receipt or delivery points, and a variety of other activities. Certain project types covered in this section may trigger additional stormwater permitting. Check with the ECP Lead to ensure that all stormwater requirements are met prior to construction.

1. Aboveground facilities shall not be located in any wetland, except as permitted or where the location of such facilities outside of wetlands would prohibit compliance with U.S.DOT regulations.

2. Install temporary sediment barriers at the base of slopes adjacent to roads and at waterbodies and wetlands in accordance with Sections 5.1.4 and 6.3 respectively.

3. Inspect temporary sediment barriers daily in areas of active construction to ensure proper functioning and maintenance. In other areas with no construction or equipment operation, sediment barriers will be inspected and maintained on a weekly basis throughout construction, and within 24 hours of each 0.5 inch of rainfall. Conduct an inspection within 24 hours once a storm event has produced 0.5 inch of rainfall, even if the storm event is still continuing.

4. If a waterbody is present on or immediately adjacent to an existing facility property where work is being conducted, install sediment barriers as necessary along the edge of the construction area to contain spoil and sediment within the work area.

5. All extra work areas should be located at least 50 feet away from the water's edge of a waterbody or a wetland, except where the adjacent upland consists of cultivated or rotated cropland or other disturbed land. FERC approval is necessary for the use of work areas if these setback conditions cannot be met.

6. Wetland boundaries and buffers (e.g., extra work area setbacks, refueling restrictions) must be clearly marked in the field with signs and /or highly visible flagging until construction-related ground disturbing activities are complete.

7. When work is required within a wetland at an existing facility, and standing water or saturated soils are present, or if construction equipment causes ruts or mixing of the topsoil and subsoil in wetlands, use low-ground-weight construction equipment or operate normal equipment on timber riprap, prefabricated equipment mats or terra mats. Do not use more than two layers of timber riprap to stabilize the work area.

8. Maintain all temporary sediment barriers in place until permanent revegetation measures are successful or the upland areas adjacent to wetlands, waterbodies and roads are stabilized.

9. Remove temporary sediment barriers from an area when replaced by permanent erosion or sediment control measures or when the area has been successfully restored as specified in Section 8.1.

10. Temporary slope breakers are to be installed on all disturbed areas as necessary to avoid excessive erosion as described in Section 3.5.4.

11. Where required for work in wetlands (except areas where standing water is present or soils are saturated) segregate topsoil as described in Section 3.5.3.1.

12. Place spoil at least 10 feet upgradient from the edge of waterbodies or as indicated on construction drawings. Spoil will be contained with erosion and sediment control devices to prevent spoil materials or silt-laden water from transferring into waterbodies and wetlands or off of the facility property.

13. If required, dewatering should be conducted as described in Section 3.5.6.

14. The Contractor shall make every reasonable effort to complete final cleanup of an area (including final grading and installation of permanent erosion control structures) within 20 days after ground disturbing activities are completed. If seasonal or other weather conditions prevent compliance with these time frames, continue to inspect and maintain temporary erosion and sediment controls (temporary slope breakers and sediment barriers) until conditions allow completion of cleanup. Cleanup shall be conducted in accordance with Section 3.6 of this document.

15. Grade to contours shown on construction drawings or site plans or return grade to pre-construction contours.

16. New gravel, stone and paving at the site shall be placed in accordance with construction drawings. No additional gravel, stone, or paving shall be added without prior approval by ECP.

17. Install permanent erosion controls and post-construction stormwater measures at the locations shown on the construction drawings.

18. Disturbed soils will be seeded within 6 working days of final grading, weather and soil conditions permitting, unless permit conditions indicate otherwise.

19. Remove all timber riprap and prefabricated equipment mats in any wetlands upon completion of construction.

4. SPECIAL CONSTRUCTION METHODS

The Company will utilize the following specialized construction procedures for agricultural areas, road crossings, and residential areas along the pipeline project, when applicable. The project construction drawings, Line Lists, and Construction Contract will indicate the locations where specialized construction methods will be used.

4.1 AGRICULTURAL AREAS

The following sections identify construction procedures and best practices for activities within actively cultivated or rotated land used for the production of crops including but not limited to corn, grains, orchards, vineyards and hayfields.

4.1.1 Drain Tiles

Develop procedures for constructing through drain-tiled areas and repairing drain tiles after construction. Engage qualified drain tile specialists, as needed, to conduct or monitor repairs to drain tile systems affected by construction. Use drain tile specialist from the project area, if available.

1. Attempt to locate existing drain tiles.
2. Probe all drainage tile systems within the area of disturbance to check for damage.
3. Ensure that the depth of cover over the new pipeline is sufficient to avoid interference with drain tile systems (existing or proposed). For adjacent pipeline loops in agricultural areas, install the new pipeline with at least the same depth of cover as the existing pipeline(s).
4. Repair damaged drain tiles to their original or better condition (Figure SU-1). Filter-covered drain tiles may not be used unless the local soil conservation authorities and the landowner agree in writing prior to construction.

4.1.2 Irrigation

Maintain water flow in crop irrigation systems, unless shutoff is coordinated with affected parties. Repair any damage to irrigation systems as soon as practical.

4.1.3 Soil Compaction Mitigation & Restoration

The following measures are to be employed during decompaction and restoration of soil within agricultural areas disturbed by construction activities:

1. In agricultural areas, test topsoil and subsoil disturbed by construction activities for compaction at regular intervals. Use penetrometers or other appropriate devices to conduct tests. In order to approximate preconstruction conditions, conduct tests on the same soil type under similar moisture conditions in undisturbed areas.
2. Plow severely compacted soils with a paraplow or other deep tillage implement;
    a. In areas where topsoil has been segregated, plow the subsoil before replacing the segregated topsoil.

b. If subsequent construction and cleanup activities result in further compaction, conduct additional tilling.

3. Soils imported for use within agricultural areas are to be certified as free of noxious weeds and soil pests, unless otherwise approved by the landowner.

4. Remove excess rock from at least the top 12 inches of soil in all cultivated or rotated cropland, managed pastures, hayfields. The size, density, and distribution of rock on the construction work area shall be similar to adjacent areas not disturbed by construction. The landowner or land management agency may approve other provisions in writing.

4.2 ROAD CROSSINGS

The "open cut" method is typically used when installing the pipeline across small roads (Figure RD-4). Traffic is diverted while the trench is excavated across the road and the pipeline is installed. An open cut crossing may involve closing the road to all traffic and constructing an adequate detour around the crossing area, or excavating one-half of the road at a time allowing through traffic to be maintained. Any detour constructed around the crossing area must remain within the approved construction workspace. After completing the crossing, all backfill is compacted, the road bed is repaired and the road surface is replaced.

Bores are often used to install the pipeline across highways, major roads with heavy traffic, and railroads (Figure RD-5), unless the crossing permit allows an open cut crossing. Similar to a directional drill, as discussed in Section 4.4, the road bore is accomplished with a horizontal drill rig or boring machine. The boring machine drills a hole under the road to allow insertion of the pipe. Typically, a dummy pipe section is pulled through which is welded to the line pipe. The dummy pipe is pulled back through placing the line pipe in the crossing. In some instances, a casing (another larger pipe) is installed in the hole and the pipeline is inserted inside the casing. Casings typically are not installed today, although some states require casings on rail crossings. Casings also may be used in soils where it is difficult to pull pipe. The benefit of the road bore is that it allows installation of the pipeline without disrupting traffic.

Access roads shall be used and maintained in accordance with Section 3.2.

4.3 RESIDENTIAL AREAS

Specialized construction procedures will be utilized in areas of heavy residential or commercial/ industrial congestion where residences or business establishments lie within 50 feet from the edge of the construction ROW.

1. Install safety fence at the edge of the construction ROW for a distance of 100 feet on either side of the residence or business establishment.

2. For a distance of 100 feet on either side any residence or business establishment, maintain a minimum distance of 25 feet between any structure and the edge of the construction work area. If a distance of 25 feet cannot be maintained, refer to Section 4.3.2.

3. If crushed stone/rock access pads are used in residential areas, rock shall be placed on nonwoven synthetic geotextile fabric to facilitate rock removal after construction.

4. Attempt to leave mature trees and landscaping intact within the construction work area unless the trees and landscaping interfere with the installation techniques or present unsafe working conditions, or as specified in landowner agreements.

5. Prevent the mixing of subsoil and topsoil by implementing segregation methods in all residential areas, except where the topsoil is being replaced, as stipulated in Section 3.5.3.1, unless the landowner or land managing agency specifically approves otherwise.

In addition to the aforementioned specialized procedures, smaller "spreads" of labor and equipment, operating independent of the mainline work force, will utilize either the stove pipe or drag section pipeline construction techniques in those areas of congestion where a minimum distance of 25 feet cannot be maintained between the residence (or business establishment) and the edge of the construction work area. In no case shall the temporary work area be located within 10 feet of a residence unless the landowner agrees in writing, or the area is within the existing maintained ROW.

The following techniques shall be utilized for a distance of 100 feet on either side of the residence or business establishment at the locations identified in the Company Construction Contract and/or Line List. Refer to site-specific residential construction plans, as applicable.

4.3.1 Stove Pipe Technique

The stove pipe construction technique is a less efficient alternative to the mainline method of construction, typically used when the pipeline is to be installed in very close proximity to an existing structure or when an open trench would adversely impact a commercial/industrial establishment. The technique involves installing one joint of pipe at a time whereby the welding, weld inspection, and coating activities are all performed in the open trench. At the end of each day after the pipe is lowered-in, the trench is backfilled and/or covered with steel plates or timber mats. The length of excavation performed each day cannot exceed the amount of pipe installed.

4.3.2 Drag Section Technique

The drag section construction technique, while less efficient than the mainline method, is normally preferred over the stove pipe alternative. This technique involves the trenching, installation, and backfill of a prefabricated length of pipe containing several segments all in one day. At the end of each day after the pipe is lowered-in, the trench is backfilled and/or covered with steel plates or timber mats. Use of the drag section technique will typically require adequate staging areas outside of the residential and/or commercial/industrial congestion for assembly of the prefabricated sections.

4.3.3 Residential Area Cleanup and Restoration

Restore all lawn areas and landscaping immediately following cleanup operations, or as specified in landowner agreements, including

1. Perform appropriate soil compaction mitigation in severely compacted residential areas.

2. Remove excess rock from at least the top 12 inches of soil in all cultivated or rotated cropland, managed pastures, hayfields. The size, density, and distribution of rock on the construction work area shall be similar to adjacent areas not disturbed by construction. The landowner or land management agency may approve other provisions in writing.
3. Importation of topsoil is an acceptable alternative to topsoil segregation. Soils imported for use within residential areas are to be certified as free of noxious weeds and soil pests, unless otherwise approved by the landowner.
4. Reseed all disturbed lawns with a seed mixture acceptable to landowner or comparable to the adjoining lawn.

In residential areas, complete final grading, topsoil replacement, and installation of permanent erosion control structures within 10 days after backfilling the trench. Mulch all disturbed areas before seeding if final grading and installation of permanent erosion control measures will not be completed within 10 days after the trench in that area is backfilled in residential areas. If seasonal or other weather conditions prevent compliance with these time frames, maintain temporary erosion controls (i.e., temporary slope breakers, sediment barriers, and mulch) until conditions allow completion of cleanup.

Landowners shall be compensated for damages in a fair and reasonable manner, and as specified in the damage provision within the controlling easement on each property.

4.4 HORIZONTAL DIRECTIONAL DRILL METHOD

Horizontal Directional Drilling (HDD) is a trenchless crossing method that can help avoid direct impacts to sensitive resources (e.g., waterbodies and wetlands) or infrastructure (e.g., roads and railways) by directionally drilling beneath them. HDD installation typically is carried out in three stages:

1. Directional drilling of a small diameter pilot hole;
2. Enlarging the pilot hole to a sufficient diameter to accommodate the pipeline; and,
3. Pulling the prefabricated pipeline, or pull string, into the enlarged bore hole.

For each waterbody or wetland that would be crossed using the HDD method, the Company will prepare a project-specific HDD Plan that includes:

- Site-specific construction diagrams that show the location of mud pits, pipe assembly areas, and all areas to be disturbed or cleared for construction;
- Justification that disturbed areas are limited to the minimum needed to construct the crossing;
- Identification of any aboveground disturbance or clearing between the HDD entry and exit workspaces during construction;
- A description of how an inadvertent release of drilling mud would be contained and cleaned up; and
- A contingency plan for crossing the waterbody or wetland in the event the HDD is unsuccessful and how the abandoned drill hole would be sealed, if necessary.

The HDD Plan will be provided within the project-specific Clearance Package / Permit Book.

Section 7(c) and prior notice projects are required to file HDD plans for the review and written approval by the FERC. (This requirement to file a plan does not apply to projects constructed under the automatic authorization provisions in the FERC's regulations.)

During post-construction maintenance activities, do not conduct any routine vegetation mowing or clearing in riparian areas or wetlands that are between HDD entry and exit points.

5. WATERBODY CROSSINGS

The intent of these procedures is to minimize the extent and duration of project related disturbances within waterbodies. The following section describes the construction procedures and mitigation measures that will be used for pipeline installations at waterbodies. The length of the crossing, the sensitivity of the area, existing conditions at the time of the crossing, and permit requirements will determine the most appropriate measures to be used.

The *Waterbody Reference Citing FERC Requirements* in Appendix B summarizes general waterbody crossing methods and requirements identified in the FERC Procedures. These tables provide a brief reference of the restrictions on construction techniques for waterbody crossings; equipment bridges; construction time windows. However, as more stringent agency specific requirements may exist, refer to the Clearance Package / Permit Book for project-specific requirements.

5.1 GENERAL WATERBODY PROCEDURES

Pipeline construction across waterbody channels may result in short term water quality impacts. The following general procedures are to be followed to minimize or avoid impacts at waterbody crossings:

1. Crossings of waterbodies may proceed using standard upland construction techniques when they are dry or frozen and not flowing provided that the EI verifies that water is unlikely to flow between initial disturbance and final stabilization of the feature. In the event of perceptible flow, all applicable requirements of Section 5 must be followed.
2. Construct crossings as close to perpendicular to the axis of the waterbody channel as engineering and routing conditions permit.
3. Where waterbodies meander or have multiple channels, route the pipeline to minimize the number of waterbody crossings.
4. Perform mobilization of construction equipment, trench excavation, and backfilling in a manner that will minimize the potential for erosion and sedimentation within the waterbody channel.
5. Locate all extra work areas, such as staging and additional spoil storage areas, at least 50 feet away from water's edge, except where the adjacent upland consists of cultivated or rotated cropland or other disturbed land. Site-specific written approval by FERC is required for all extra work areas with a less than 50-foot setback and associated measures to be used to ensure the waterbody is adequately protected.
6. Implement erosion control measures to confine water quality impacts within the immediate construction area and to minimize impacts to downstream areas.
7. Place all spoil from the waterbody within the construction ROW at least 10 feet from the water's edge or in the extra work areas shown on the construction drawings.
8. Maintain adequate flow rates to protect aquatic life and prevent the interruption of existing downstream uses.
9. Dewater trench in accordance with the procedures described in Section 3.5.6.

5.1.1 Time Windows for Instream Work

Unless expressly permitted or further restricted by the appropriate federal or state agency in writing on a site-specific basis, instream work must occur during the following time windows:

- Coldwater fisheries – June 1 through September 30; and
- Coolwater and warmwater fisheries – June 1 through November 30.

Installation or removal of equipment bridges above the top of bank is not subject to the aforementioned time windows.

5.1.2 Equipment Bridges

Equipment bridges may be installed and used where needed to allow equipment access across waterbodies.

1. Until the equipment bridge is installed, only clearing equipment and equipment necessary for installation of equipment bridges may cross the waterbody, and the number of crossings shall be limited to one crossing per piece of equipment, unless otherwise authorized by the appropriate permitting agency. EI approval is required prior to equipment crossing a waterbody without an equipment bridge.

2. Construct and maintain equipment bridges that allow unrestricted flow and prevent sediment from entering the waterbody. The Construction Contract agreement and/or permit conditions may specify the type of bridge to be used. Examples of bridges are provided below:
    a. Equipment pads with or without culvert(s), as illustrated in Figure BR-1;
    b. Clean crushed stone and culvert(s), as illustrated in Figure BR-2;
    c. Flexi-float or portable bridges, as illustrated in Figure BR-3;
    d. Double equipment pads, geotextile fabric and sideboards with or without culvert(s); or
    e. Railroad car bridges without culverts.

3. Design and maintain each equipment bridge to withstand the highest flows that would occur. Align culverts/flumes to prevent bank erosion or streambed scour. If necessary, install energy dissipating devices downstream of culverts.

4. Do not use soil to construct or stabilize equipment bridges.

5. Design and maintain equipment bridges to prevent sediment from entering the waterbody.

6. Remove temporary equipment bridges as soon as practicable after permanent seeding.

7. If there will be more than 1 month between final cleanup and the beginning of permanent seeding and reasonable alternative access to the ROW is available, remove temporary equipment bridges as soon as practicable after final cleanup.

8. Obtain any necessary approval or authorization from the COE and/or the appropriate state agency for temporary and permanent bridges.

5.1.3 Clearing and Grading near Waterbodies

1. Confine construction activities and ground disturbance to the construction ROW boundaries, as shown on the construction drawings. Restrict extra work areas (such as staging areas and additional spoil storage areas) to only those shown on the construction drawings.

2. If the pipeline parallels a waterbody, maintain at least 15 feet of undisturbed vegetation between the waterbody (and any adjacent wetland) and the ROW except where maintaining this offset will result in greater environmental impact.

3. Clear the ROW adjacent to all waterbodies *up to the high water bank* (where discernible). *Within 10 feet of the high water bank*, trees shall be cut to ground level and with little to no ground disturbance. **Do not grub** this 10-foot vegetative strip with equipment.

4. Immediately remove all cut trees and branches that inadvertently fall into a waterbody and stockpile in an upland area within the construction ROW for disposal.

5. Grade the ROW adjacent to waterbodies *up to within 10 feet of the high water bank*, leaving an ungrubbed vegetative strip intact.

6. Clearing and grading operations may proceed through the 10-foot vegetative strip **only on the working side of the ROW** in order to install the equipment bridge and travel lane. Use temporary sediment barriers to prevent the flow of bank spoil into the waterbody.

5.1.4 Temporary Erosion and Sediment Controls at Waterbodies

Install sediment barriers immediately after initial disturbance of the waterbody or adjacent upland. Sediment barriers must be properly maintained throughout construction and repaired or reinstalled as necessary (such as after backfilling of the trench), until replacement by permanent erosion controls or restoration of adjacent upland areas is complete. Temporary erosion and sediment control measures are addressed in more detail in Section 3.5, however, the following specific measures must be implemented at stream crossings:

1. Install sediment barriers across the entire construction ROW at all waterbody crossings, where necessary to prevent the flow of sediments into the waterbody.

2. Install sediment barriers along the edge of the construction ROW as necessary to contain spoil within the construction ROW and prevent sediment flow into the waterbody where waterbodies are adjacent to the construction ROW or parallel to the construction ROW and the ROW slopes toward the waterbody.

3. Removable or temporary sediment barriers, such as slope breakers or drivable berms as described in Section 3.5.4, may be used in lieu of sediment barriers in front of equipment bridges or timber mats across the travel lane. Removable sediment barriers can be removed during the construction day, but must be reinstalled after construction has stopped for the day or whenever heavy precipitation is imminent.

4. Use temporary trench plugs at all waterbody crossings, as necessary, to prevent diversion of water into upland portions of the pipeline trench and to keep any accumulated trench water out of the waterbody. Trench plugs shall be of sufficient size to withstand upslope water pressure.

5.2 TYPES OF WATERBODY CROSSING METHODS

Waterbody crossing techniques allowed for use on a project will be determined by agency consultations and permits. Construction at waterbodies will be conducted using two principal crossing methods, a "dry" crossing and a "wet" crossing. The "dry" or "dry-ditch" crossing procedure is further divided into a flume crossing and a dam-and-pump crossing methods. These methods are designed to maintain downstream flow at all times and to isolate the construction zone from the stream flow by channeling the water flow through a flume pipe or by damming the flow and pumping the water around the construction area. The overall objective is to minimize siltation of the waterbody and to facilitate trench excavation of saturated spoil. The two "dry" crossings are further described below in Sections 5.2.1 and 5.2.2.

The "wet" or "open-cut" crossing method involves trenching in the waterbody without isolating the construction zone from the stream flow. The objective of this method is to complete the waterbody crossing as quickly as practical in order to minimize the duration of impacts to aquatic resources. The wet crossing method is further described below in Section 5.2.3.

All streams, their classifications, timing windows, applicable permits and crossing procedures will be identified in the project-specific Clearance Package/Permit Book and on the construction drawings. Unless approved otherwise by the appropriate federal or state agency, pipeline construction and installation must occur using one of the two "dry" crossing methods for waterbodies state-designated as either coldwater or significant coolwater or warmwater fisheries, or federally designated as critical habitat. The flume and dam-and-pump crossing methods are applicable to waterbodies up to 30 feet wide (possibly wider depending on flow volume and rate) at the water's edge at the time of construction.

5.2.1 Flume Crossing

The flume crossing method utilizes a flume pipe(s) to transport stream flow across the disturbed area and allows trenching to be done in drier conditions (Figure WC-3). The flume pipe(s) installed across the trench will be sized to accommodate anticipated stream flows. Flumes are generally not recommended for use on a waterbody with a broad unconfined channel, unstable banks, a permeable substrate, excessive stream flow, or where the installation and construction of the flume crossing will adversely affect the bed or banks of the stream.

The flume waterbody crossing shall be installed as follows:

1. Install flume pipe(s) after blasting and other rock breaking measures (if required), but before trenching;
2. Properly align flume pipe(s) to prevent bank erosion and streambed scour;
3. Use sand bags or equivalent dam diversion structure to provide a seal at either end of the flume to channel water flow (some modifications to the stream bottom may be required to achieve an effective seal);

4. **Do not remove flume pipe** during trenching, pipe laying (thread pipe underneath the flume pipe(s)), or backfilling activities, or initial streambed restoration efforts, except for crossings where a dam-and-pump method (as described in Section 5.2.2 below) has been established as an alternative measure to redirect stream flow; and
5. Remove all flume pipes and dams that are not also part of the equipment bridge as soon as final cleanup of the stream bed and bank is complete.

5.2.2 Dam-and-Pump Crossing

The dam-and-pump crossing method is presented as an alternative dry crossing procedure to the flume crossing (in limited cases, it may be used in combination with a flume crossing). The dam-and-pump method is accomplished by utilizing pumps to transport stream flow across the disturbed area (Figure WC-4). This method involves placing sandbags across the existing stream channel upstream from the proposed crossing to stop water flow and downstream from the crossing to isolate the work area. Pumps are used to pump the water across the disturbed area and back into the stream further downstream.

The dam-and-pump procedure allows for more space and flexibility during trenching and pipe installation, which shortens the duration of time spent at the waterbody. The dam-and-pump method may be used for crossings of waterbodies where pumps can adequately transfer stream flow volumes around the work area, and where there are no concerns about sensitive species passage.

The dam-and-pump crossing method shall be installed as follows:

1. Install and properly seal sandbags at the upstream and downstream location of the crossing;
2. Create an in-stream sump using sandbags if a natural sump is unavailable for the intake hose;
3. Initiate pumping of the stream around the work area prior to excavating the trench;
4. Monitor dam and pumps at all times to ensure proper operation until the waterbody crossing is completed; and,
5. Remove the sandbag dams, pumps and hoses and return normal flow back to the waterbody following installation and restoration of the streambed.

Implementation of the dam-and-pump crossing method will meet the following performance criteria:

- Use sufficient pumps, including onsite backup pumps, to maintain downstream flows;
- Construct dams with materials that prevent sediment and other pollutants from entering the waterbody (e.g., sandbags or clean gravel with plastic liner);
- Screen all intake hoses to minimize the entrainment of fish and other aquatic life
- Prevent streambed scour at pump discharge; and
- Continuously monitor the dam and pumps to ensure proper operation throughout the waterbody crossing.

5.2.3 Wet Crossing

Open-cut crossings involve excavating a trench for the pipeline across the bottom of the waterbody to be crossed (Figure WC-2). Depending on the depth of the water, construction equipment may be placed on barges or other floating platforms to excavate the pipe trench.

This construction technique is typically used to cross waterbodies that are not state-designated, such as ephemeral drainage ditches, and ephemeral and intermittent streams, as well as intermediate and major waterbodies with substantial flows that cannot be effectively flumed or pumped around the construction zone using one of the dry crossing techniques.

5.3 FERC WATERBODY CLASSIFICATIONS

In the FERC Procedures, a “waterbody” is defined to include any natural or artificial stream, river, or drainage with perceptible flow at the time of crossing, and other permanent waterbodies such as ponds and lakes. Waterbodies have been further divided into three classifications by FERC depending on the width of the feature, which dictate construction limitations or requirements.

5.3.1 Minor Waterbodies

FERC defines a "minor waterbody” as a waterbody less than or equal to 10 feet wide at the water’s edge at the time of crossing. Minor waterbodies shall be crossed in accordance with the following requirements:

1. All spoil from minor waterbody crossings must be placed in the construction ROW at least 10 feet from the water’s edge or in additional extra work areas as described above in Section 5.1.

2. Unless approved otherwise by the appropriate federal or state agency, utilize a dry crossing construction technique to install crossings at all minor waterbodies that are state-designated fisheries or federally designated as critical habitat, as identified in the Clearance Package/ Permit Book (Figures WC-3 or WC-4).

    a. All construction equipment must use an equipment bridge to cross state-designated fisheries as specified in Section 5.1.2.

3. Where a dry-ditch crossing is not required, minor waterbodies may be crossed using the wet crossing method, with the following restrictions:

    a. Except for blasting and other rock breaking measures, complete instream construction activities (including trenching, pipe installation, backfill, and restoration of the streambed contours) within 24 hours. Streambanks and unconsolidated streambeds may require additional restoration after this period;

    b. Limit use of equipment operating in the waterbody to that needed to construct the crossing;

    c. If a flume is installed within the waterbody during mainline activities, it can be removed just prior to lowering in the pipeline (The 24-hour timeframe starts as soon as the flume is removed.); and,

d. Equipment bridges are not required at minor waterbodies that do not have a state-designated fishery classification or protected status (e.g., agricultural or intermittent drainage ditches). However, if an equipment bridge is used it must be constructed as described in Section 5.1.2.

5.3.2 Intermediate Waterbodies

FERC defines an "intermediate waterbody" as a waterbody greater than 10 feet wide but less than or equal to 100 feet wide at the water's edge at the time of crossing. Intermediate waterbodies shall be crossed in accordance with the following requirements:

1. All spoil from intermediate waterbody crossings must be placed in the construction ROW at least 10 feet from the water's edge or in additional extra work areas as described above in Section 5.1.

2. Unless approved otherwise by the appropriate federal or state agency, install the pipeline using a dry crossing method for crossings of waterbodies up to 30 feet wide (at the water's edge at the time of construction) that are
    a. state-designated as either coldwater or significant coolwater or warmwater fisheries, or
    b. federally designated as critical habitat.

3. Where a dry-ditch crossing is not required, intermediate waterbodies may be crossed using the wet crossing method, with the following restrictions:
    a. Complete instream construction activities (not including blasting and other rock breaking measures) within 48 hours, unless site-specific conditions make completion within 48 hours infeasible;
    b. Limit use of equipment operating in the waterbody to that needed to construct the crossing; and,
    c. All other construction equipment must cross on an equipment bridge as specified in Section 5.1.2.

5.3.3 Major Waterbodies

FERC defines a "major waterbody" as a waterbody greater than 100 feet wide at the water's edge at the time of crossing. Before construction, the Company shall prepare and file for the review and written approval by the FERC a detailed, site-specific construction plan and scaled drawings identifying all areas to be disturbed by construction for each major waterbody crossing, however the scaled drawings are not required for any offshore portions of pipeline projects. (The requirement to file major waterbody crossing plans does not apply to projects constructed under the automatic authorization provisions of the FERC's regulations.) This site-specific plan must be developed in consultation with the appropriate state and federal agencies and shall include extra work areas, spoil storage areas, sediment control structures, etc., as well as mitigation for navigational issues.

Upland spoil from major waterbody crossings must be placed in the construction ROW at least 10 feet from the water's edge or in additional extra work areas as described in Section 5.2.

5.4 Restoration

Restore and stabilize the waterbody banks and channel in accordance with this section.

1. Return all waterbody banks to preconstruction contours or to stable angle of repose as approved by the EI.

2. Use clean gravel or native cobbles for the upper 12 inches of trench backfill in all waterbodies identified in the Clearance Package/Permit Book as coldwater fisheries, unless otherwise specified by state-specific agency recommendations or permit conditions.

3. For wet crossings, stabilize waterbody banks and install temporary sediment barriers within 24 hours of completing the crossing.

4. For dry crossings, complete bank stabilization before returning flow to the waterbody channel.

5. Limit the use of rock riprap to areas where flow conditions preclude effective vegetation stabilization techniques such as seeding and erosion control fabric, unless otherwise specified by COE and state permits. Limit the placement of rock riprap to the slopes along the disturbed waterbody crossing. Application of riprap for bank stabilization must comply with COE, or its delegated agency, permit terms and conditions.

6. Install erosion control fabric, in accordance with Section 3.6.1.2, or a functional equivalent on waterbody banks at the time of final bank contouring (Figure EC-13, WC-5). Do not use synthetic monofilament mesh/netted erosion control materials in areas designated as sensitive wildlife habitat unless the product is specifically designed to minimize harm to wildlife.

7. Revegetate disturbed riparian areas with native species of conservation grasses, legumes and woody species similar in density to adjacent undisturbed lands.

8. In the event that final cleanup is deferred more than 20 days after the trench is backfilled, all slopes within 100 feet of waterbodies shall be mulched with 3 tons/acre of straw.

9. Remove all temporary sediment barriers when replaced by permanent erosion controls or when restoration of adjacent upland areas is successful as specified in Section 8.1.

10. Install a permanent slope breaker and a trench breaker at the base of slopes greater than 5% that are less than 50 feet from each waterbody crossed.

6. WETLAND CROSSINGS

The term “wetland” as used in this plan includes any area that satisfies the requirements of the current federal methodology for identifying and delineating wetlands. The requirements outlined below do not apply to wetlands in actively cultivated or rotated cropland. Standard upland protective measures, including workspace and topsoil segregation requirements, apply to these agricultural wetlands.

Wetland boundaries are identified on the construction drawings and within the Clearance Package / Permit Book. Wetlands are delineated prior to construction using current federal methodology and summarized within a wetland delineation report, which identifies the following information for all wetlands that would be affected by the construction ROW:

- Location, including pipeline milepost if crossed by centerline;
- National Wetland Inventory (NWI) classification;
- Crossing length in feet;
- Area of permanent and temporary disturbance that would occur in each wetland, sorted by NWI classification type.

6.1 General Wetland Procedures

Crossing procedures are to comply with COE, or its delegated agency, permit terms and conditions. Project-specific permits or authorizations issued by the COE or other appropriate agenc(ies) are provided in the Clearance Package / Permit Book. Implement the following general requirements during planning and construction near or across wetlands:

1. Route the pipeline to avoid wetland areas to the maximum extent possible.

2. If a wetland cannot be avoided or crossed by following an existing right-of-way, route the new pipeline in a manner that minimizes disturbance to wetlands. Where looping an existing pipeline, overlap the existing pipeline right-of-way with the new construction right-of-way. In addition, locate the loop line no more than 25 feet away from the existing pipeline unless site-specific constraints would adversely affect the stability of the existing pipeline.

3. Identify site-specific areas where excessively wide trenches could occur and/or where spoil piles could be difficult to maintain because existing soils lack adequate unconfined compressive strength.

4. Limit construction activity and ground disturbance in wetland areas to a construction ROW width of 75 feet or as shown on the construction drawings. Only with prior written approval from the FERC, construction ROW width within the boundaries of federally delineated wetlands may be expanded beyond 75 feet if required by site-specific topographic conditions or soil limitations.

5. All extra work areas must be located at least 50 feet away from wetland boundaries, except where the adjacent upland consists of cultivated or rotated cropland or other disturbed land. Only with prior written approval from the FERC, the Company can locate extra work areas closer than 50 feet from the wetland if site-specific conditions justify a less than 50-foot setback.

6. Aboveground facilities shall not be located in any wetland, except as permitted or where the location of such facilities outside of wetlands would prohibit compliance with U.S.DOT regulations.

7. In the event a waterbody crossing is located within or adjacent to a wetland crossing, the Company must file a site-specific crossing plan for review and obtain written approval by the FERC before construction if all measures of Sections V. and VI. of the FERC Procedures cannot be met.

8. Limit construction equipment operating in wetland areas to that needed to clear the ROW, dig the trench, fabricate and install the pipeline, backfill the trench, and restore the construction ROW. All other construction equipment shall use access roads located in upland areas to the maximum extent practical. Refer to Section 3.2 for other requirements and restrictions pertaining to access to the construction ROW or use of roads across wetlands.

6.2 Clearing and Grading at Wetlands

1. Wetland boundaries and buffers (e.g., extra work area setbacks, refueling restrictions) must be clearly marked in the field with signs and /or highly visible flagging until construction-related ground disturbing activities are complete.

2. If standing water or saturated soils are present, or if construction equipment causes ruts or mixing of the topsoil and subsoil in wetlands, use low-ground-weight construction equipment or operate normal equipment on timber riprap, prefabricated equipment mats or terra mats on the working side of the ROW during clearing operations.

3. Attempt to use no more than two layers of timber riprap to stabilize the ROW. If approved by the COE, woody debris can be burned in wetlands as long as it is in accordance with state and local regulations, ensuring that all woody debris is removed for disposal.

4. Cut vegetation just above ground level and grind stumps to ground level, leaving existing root systems in place and remove any excess vegetation (e.g., wood chips). Immediately remove all cut trees, limbs and branches from the wetland and stockpile in an upland area on ROW for disposal.

5. Limit pulling of tree stumps and grading activities to directly over the trenchline. Do not grade or remove stumps or root systems from the rest of the construction ROW in wetlands unless the Chief Inspector and EI determine that safety-related construction constraints require grading or the removal of tree stumps from under the working side of the construction ROW.

6. Do not cut trees outside of the construction ROW to obtain timber for riprap or equipment mats.

7. Cleared materials, such as slash, logs, brush, and wood chips, shall not be permanently placed within wetland areas.

6.3 Temporary Erosion & Sediment Control at Wetlands

Install sediment barriers immediately after initial ground disturbance at the following locations:

- Within the ROW at the edge of the boundary between wetland and upland;
- At the base of slopes greater than 5% where the base of the slope is less than 50 feet from a wetland;
- Across the entire ROW immediately upslope of the wetland boundary to contain spoil within the construction ROW and prevent sediment flow into the wetland;
- Along the edge of the ROW, where the ROW slopes toward the wetland, to protect adjacent, off ROW wetland; and
- Along the edge of the ROW as necessary to contain spoil and prevent sediment from migrating outside the construction ROW in areas where a wetland is both within and adjacent to the construction ROW.

Maintain all sediment barriers throughout construction and reinstall as necessary (such as after backfilling of the trench) until replaced by permanent erosion controls or restoration of adjacent upland areas is complete in accordance with Section 8.1. Remove the sediment barriers during right-of-way cleanup.

6.4 Wetland Crossing Procedure

Procedures used to install a pipeline across wetlands vary depending on the level of soil stability and saturation encountered during construction. The following best management practices are to be employed during standard wetland crossings:

1. Assemble the pipeline in an upland area unless the wetland is dry enough to adequately support skids and pipe.

2. Do not use rock, soil imported from outside the wetland, tree stumps, or brush riprap to stabilize the ROW.

3. Perform topsoil segregation in accordance with Section 3.5.3.1, including segregating the top 1 foot of topsoil from the area disturbed by trenching, except in areas where standing water is present or soils are saturated. Immediately after backfilling is complete, restore the segregated topsoil to its original location.

4. If required, dewatering should be conducted as described in Section 3.5.6.

5. Minimize the length of time that topsoil is segregated and the trench is open. Do not trench the wetland until the pipeline is assembled and ready for lowering-in.

6. Use “push-pull” or “float” construction techniques to place the pipe in the trench where water and other site conditions allow (Refer to Section 6.4.1 below).

7. Install permanent trench breakers at the wetland boundaries and/or seal the trench bottom as necessary to maintain the original wetland hydrology at locations where the pipeline trench may drain a wetland.

8. Install a permanent slope breaker and a trench breaker at the base of slopes near the boundary between the wetland and adjacent upland areas for each wetland crossed.

9. Install a permanent slope breaker across the construction right-of-way at the base of slopes greater than 5% where the base of the slope is less than 50 feet from the wetland, or as needed to prevent sediment transport into the wetland. In some areas, with the approval of the EI, an earthen berm may be suitable as a sediment barrier adjacent to the wetland.

10. Restore segregated topsoil to its original position after backfilling is complete. When required, additional fill material imported from off the ROW must be approved by the EI.

11. Preconstruction wetland contours and flow regimes will be restored to the extent practical.

6.4.1 Push-pull Technique

The "push-pull" or "float" or "drag section" method may be utilized during wetland crossings if conditions are suitable at the time of construction. Sufficient, naturally present groundwater volumes that fill the excavated trench are required to facilitate this installation method. This method may be used to install the pipeline if the wetland to be crossed contains standing water or saturated and/or unstable soils.

- Trenching equipment will excavate a trench across the wetland, either using low-ground-weight equipment or working on timber matting.
- While the trench is being excavated, the pipeline crossing sections will be assembled and welded together in uplands.
- Prefabricated pipeline crossing sections will then be pushed or pulled into the trench; floated across the wetland and released into the trench if the trench is filled with water; or, carried into position with sideboom tractors supported on equipment mats.
- The excavating equipment will "walk through" the wetland by carrying timber mats and repositioning the mats as it operates from one mat to the next through the wetland during trenching, backfilling, and cleanup activities.

6.5 Wetland Cleanup and Restoration

1. Restore pre-construction wetland contours to maintain the wetland hydrology.

2. Revegetate the ROW with annual ryegrass at 40 lbs/acre PLS or with the recommended Wetland Seed Mix in Appendix C or project-specific seed mix where applicable, unless standing water is present or unless prohibited by state or land management agency.

3. **Do not use lime, mulch or fertilizer in wetland areas** unless required in writing by the appropriate federal or state agency**,** as identified in the Clearance Package/Permit Book.

4. In the event that final cleanup is deferred more than 20 days after the trench is backfilled, all slopes adjacent to wetlands shall be mulched with 3 tons/acre of straw for a minimum of 100 feet on each side of the crossing.

5. Remove all project-related material used to support equipment on the construction ROW, including timber riprap and prefabricated equipment mats, upon completion of construction.

6. Develop specific procedures in coordination with the appropriate federal or state agency, where necessary, to prevent the invasion or spread of invasive vegetation (such as purple loosestrife and phragmites).

7. Ensure that all disturbed areas permanently revegetate in accordance with Section 8.1.

8. Remove temporary sediment barriers located at the boundary between wetland and adjacent upland areas after upland revegetation and stabilization of adjacent upland areas are successful as specified in Section 8.1.

7. SPILL PREVENTION & RESPONSE

7.1 SPCC / PPC Plan

The Company and Contractor shall adhere to the SPCC/PPC Plan at all times. This plan has been prepared to meet the requirements of several federal regulations and guidelines: the FERC's Plan and Procedures; Oil Pollution Act; Federal Water Pollution Control Act; Comprehensive Environmental Response, Compensation and Liability Act of 1980; the Resource Conservation and Recovery Act; Toxic Substances Control Act; and, the Clean Water Act.

The purpose of the SPCC/PPC Plan is to reduce the probability and risk of a potential spill or release of oil or hazardous materials during construction-related activities. The objectives of this plan are to identify and address:

- The type and quantity of material handled, stored, or used on site during construction;
- Measures to be taken for spill preparedness and prevention;
- Emergency response procedures;
- Spill incident reporting/notification procedures; and
- Local emergency response team arrangements.

7.2 Spill Prevention Measures

Structure operations in a manner that reduce the risk of spills or the accidental exposure of fuels or hazardous materials to waterbodies or wetlands. At a minimum,

1. All employees handling fuels and other hazardous materials are to be properly trained.

2. All equipment shall be in good operating order and inspected on a regular basis.

3. Fuel trucks transporting fuel to on-site equipment should travel only on approved access roads.

4. All equipment is to be parked overnight and/or fueled at least 100 feet from any wetland or waterbody. These activities can occur closer only if the EI determines that there is no reasonable alternative, and appropriate steps have been taken (including secondary containment structures) to prevent spills and provide for prompt cleanup in the event of a spill.

5. Do not store hazardous materials, including chemicals, fuels, and lubricating oils within 100 feet of a wetland, waterbody or designated municipal watershed area, unless the location is designated for such use by an appropriate governmental authority. This applies to storage of these materials and does not apply to normal operation or use of equipment in these areas. If the 100-foot setback cannot be met, this activity can be performed within the 100-foot setback, with EI approval, if done in accordance with the SPCC/PPC Plan.

6. Do not perform fondu or concrete coating activities within 100 feet of any wetland or waterbody boundary, unless the location is an existing industrial site designated for such use. If the 100-foot setback cannot be met, these activities can be performed within the 100-foot setback, if the EI

determines that there is no reasonable alternative and appropriate steps have been taken (including secondary containment structures) to prevent spills and provide for prompt cleanup in the event of a spill.

7. Pumps operating within 100 feet of a waterbody or wetland boundary shall utilize appropriate secondary containment systems to prevent spills; and

8. Bulk storage of hazardous materials, including chemicals, fuels, and lubricating oils have appropriate secondary containment systems to prevent spills.

7.3 Spill Cleanup & Response

Structure operations in a manner that provides for the prompt and effective cleanup of spills of fuel and other hazardous materials. At a minimum,

1. Ensure that each construction crew (including cleanup crews) has on hand sufficient supplies of absorbent and barrier materials to allow the rapid containment and recovery of spilled materials and knows the procedure for reporting spills and unanticipated discoveries of contamination;

2. Ensure that each construction crew has on hand sufficient tools and material to stop leaks; and,

3. Know the contact names and telephone numbers for all local, state, and federal agencies (including, if necessary, the U. S. Coast Guard and the National Response Center) that must be notified of a spill; and follow the requirements of those agencies in cleaning up the spill, in excavating and disposing of soils or other materials contaminated by a spill, and in collecting and disposing of waste generated during spill cleanup.

8. POST-CONSTRUCTION ACTIVITIES

8.1 POST-CONSTRUCTION MONITORING

Projects conducted under the blanket certificate or a project-specific Section 7 Order, shall meet the monitoring requirements set forth in this section. Company personnel shall perform the following:

1. Establish and implement a program to monitor the success of restoration upon completion of construction and restoration activities.

2. Conduct follow-up inspections of all disturbed upland areas as necessary, to determine the success of revegetation and address landowner concerns. At a minimum, conduct inspections after the first and second growing seasons.

3. In nonagricultural upland areas, revegetation shall be considered successful if the vegetative cover is sufficient to prevent the erosion of soils on the disturbed ROW and density and cover are similar to that in adjacent undisturbed area. Sufficient coverage in upland areas is defined when vegetation has a uniform 70 percent vegetative coverage.

4. In agricultural areas, revegetation shall be considered successful when upon visual survey, growth and vigor are similar to adjacent undisturbed portions of the same field, unless the easement agreement specifies otherwise.

5. In wetlands, monitor and record the success of revegetation annually, until wetland revegetation is successful:

    a. Wetland revegetation will be considered successful when the affected wetland satisfies the current federal definition for a wetland (i.e. soils, hydrology, and vegetation);

    b. Vegetation should be at least 80 percent of either the cover documented for the wetland prior to construction, or at least 80 percent of the cover in adjacent wetland areas that were not disturbed by construction;

    c. If natural rather than active revegetation was used, the plant species composition must be consistent with early successional wetland plant communities in the affected ecoregion;

    d. Invasive species and noxious weeds should be absent unless they are abundant in adjacent areas that were not disturbed by construction; and,

    e. For any wetland where revegetation is not successful at the end of 3 years after construction, the Company shall develop and implement (in consultation with a professional wetland ecologist) a remedial plan to actively revegetate the wetland.

6. Inspect all remaining temporary erosion and sediment controls during routine patrols to ensure proper functioning. Any deficiencies found will be reported and corrected as needed. Once the area has revegetated and stabilized, the erosion controls will be removed.

7. Revegetation efforts (such as fertilizing or reseeding) will continue until revegetation is successful.

8. Restoration shall be considered successful if the ROW surface condition is similar to adjacent undisturbed lands, construction debris is removed (unless otherwise approved by the land owner or land managing agency), revegetation is successful, and proper drainage has been restored.

9. Monitor and correct problems with drainage and irrigation systems resulting from pipeline construction in agricultural areas until restoration is successful.

10. Make efforts to control unauthorized off-road vehicle use, in cooperation with the landowner, throughout the life of the project. Maintain signs, gates, and vehicle trails as necessary.

8.2 POST-CONSTRUCTION MAINTENANCE

Routine maintenance of the ROW is required to allow continued access for routine pipeline patrols, maintaining access in the event of emergency repairs, and visibility during aerial patrols. Where the newly established pipeline ROW is located on other existing ROWs not affiliated with the Company, the easement holder or owner will continue to maintain their ROWs using procedures specified in their vegetative management programs.

Projects conducted under this E&SCP and subject to the FERC Plan and Procedures, shall meet the maintenance requirements set forth in this section. The following requirements restrict the amount of vegetation maintenance that can occur within new ROW.

8.2.1 Uplands

In upland areas, maintenance of the ROW will involve clearing the entire ROW of woody vegetation.

1. Routine vegetation mowing or clearing over the full width of the permanent ROW in uplands shall be conducted no more frequently than once every 3 years. However, to facilitate periodic corrosion and leak surveys, a 10-foot wide corridor centered on the pipeline may be cleared at a frequency necessary to maintain the 10-foot corridor in an herbaceous state.

2. Routine vegetation mowing or clearing shall not occur between April 15 and August 1 of any year unless specifically approved in writing by the responsible land management agency of the U.S. Fish and Wildlife Service.

8.2.2 Waterbodies and Wetlands

1. Do not conduct routine vegetation mowing or clearing over the full width of the permanent ROW in wetlands or riparian areas.

    a. Limit routine vegetation mowing or clearing practices adjacent to waterbodies to allow a riparian strip that measures 25 feet back from the waterbody's mean high water mark. This riparian strip will be allowed to permanently revegetate with native plant species across the entire construction ROW.

    b. To facilitate periodic corrosion and leak surveys within wetlands and the 25-foot-wide riparian strip adjacent to waterbodies, a corridor up to 10 feet wide centered on the

pipeline may be cleared at a frequency necessary to maintain the 10-foot corridor in an herbaceous state.

c. Trees located within 15 feet of the pipeline that have roots that could compromise the integrity of the pipeline coating may be cut and removed from the permanent ROW.

2. Do not conduct any routine vegetation mowing or clearing in riparian areas or wetlands that are between HDD entry and exit points.

3. Herbicides or pesticides shall not be used in or within 100 feet of a wetland or waterbody, except as specified by the federal or state agency.

4. Time of year restrictions apply to routine mowing as well as selective clearing of trees within riparian or wetland areas. These activities are prohibited between April 15 – August 1 of any year.

8.3 REPORTING

The Company shall maintain records that identify by milepost:

1. Method of application, application rate, and type of fertilizer, pH modifying agent, seed, and mulch used;
2. Acreage treated;
3. Dates of backfilling and seeding;
4. The location of any subsurface drainage repairs or improvements made during restoration;
5. Names of landowners requesting special seeding treatment and a description of the follow-up actions; and
6. Any problem areas and how they were addressed.

The Contractor is responsible for providing the EI with the information and documentation on applications, rates, and types of fertilizer, pH modifying agents, seed and mulch that are used during a project.

For the FERC-authorized projects, other than projects conducted under the blanket certificate, the Company will file quarterly activity reports documenting problems, including those identified by the landowner, and corrective actions taken for at least 2 years following construction.

A wetland revegetation monitoring report identifying the status of the wetland revegetation efforts will be filed at the end of 3 years following construction, and annually thereafter documenting progress within the wetland until revegetation is successful. The requirements to file wetland restoration reports with FERC does not apply to projects authorized under the blanket certificate (i.e. automatic and prior notice) or advanced notice provisions in the FERC regulations.

APPENDIX A

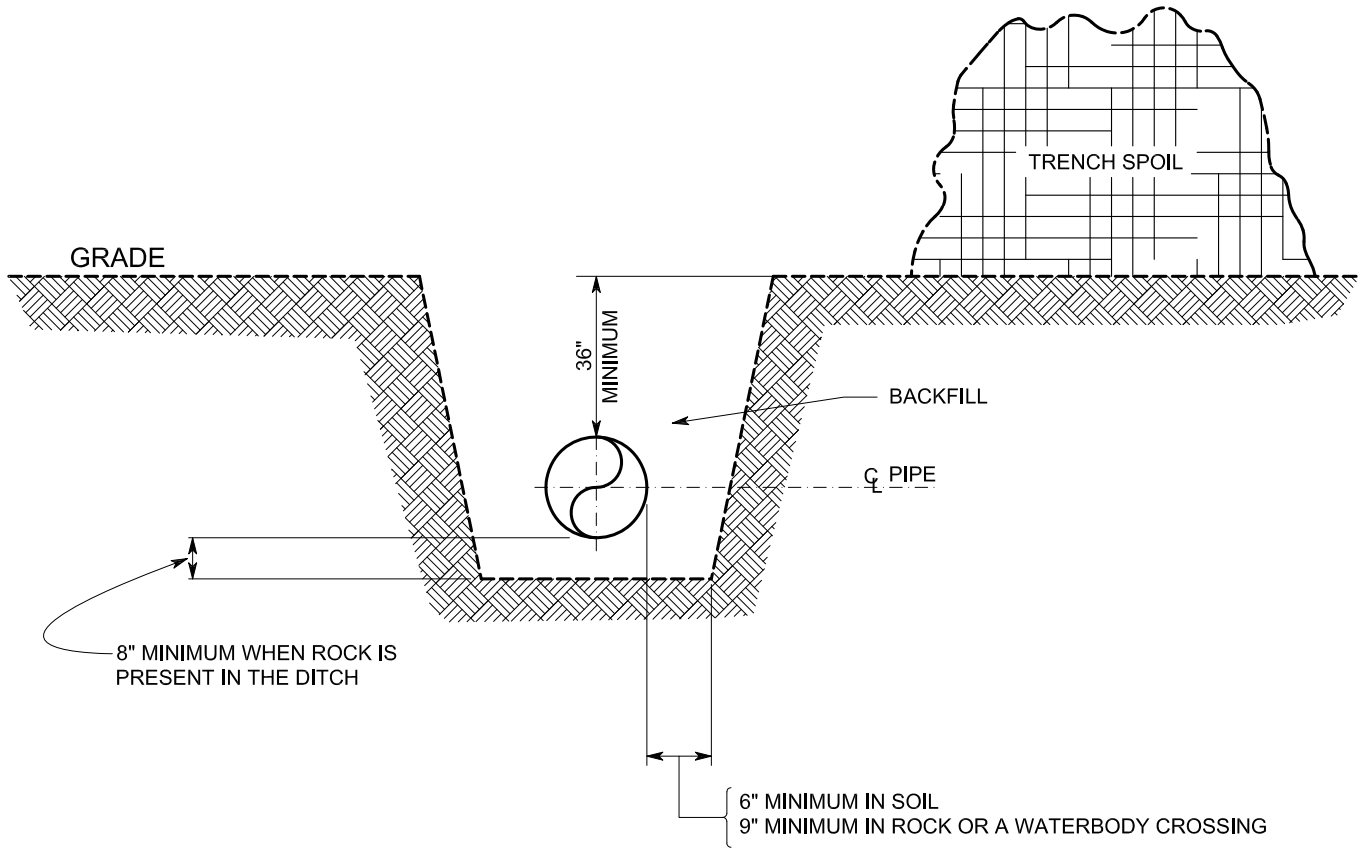
E&SCP FIGURES

FIGURE NUMBER	STANDARD NUMBER	DRAWING TITLE
CONSTRUCTION WORKAREAS (CW)		
CW-1	ES-0001	TYPICAL TRENCH DETAIL
CW-2	ES-0002	RIGHT-OF-WAY TOPSOIL SEGREGATION TECHNIQUES
CW-3	ES-0003	TYPICAL CONSTRUCTION WIDTHS ACQUIRING NEW PERMANENT RIGHT-OF-WAY
CW-4	ES-0004	TYPICAL CONSTRUCTION WIDTHS NOT ACQUIRING NEW PERMANENT RIGHT-OF-WAY (SINGLE LINE SYSTEM)
CW-5	ES-0005	TYPICAL CONSTRUCTION WIDTHS NOT ACQUIRING NEW PERMANENT RIGHT-OF-WAY (MULTIPLE LINE SYSTEM)
ACCESS ROADS & ROAD CROSSINGS (RD)		
RD-1	ES-0006	ACCESS ROAD CROSS SECTION
RD-2	ES-0007	ROCK ACCESS PAD
RD-3	ES-0008	TYPICAL TEMPORARY ACCESS ROAD THROUGH WETLANDS
RD-4	ES-0009	TYPICAL PAVED ROAD CROSSING CONTROL MEASURES (OPEN CUT)
RD-5	ES-0010	TYPICAL PAVED ROAD CROSSING CONTROL MEASURES (BORED)
EROSION CONTROLS (EC)		
EC-1	ES-0011	SILT FENCE DETAIL
EC-2	ES-0012	STRAW BALE DETAIL
EC-3	ES-0013	STRAW BALE CHECK DAM IN A DRAINAGEWAY
EC-4	ES-0014	ROCK-LINED DRAINAGE SWALE
EC-5	ES-0015	STORM DRAIN INLET PROTECTION
EC-6	ES-0016	TEMPORARY TRENCH PLUG OPTIONS
EC-7	ES-0017	TEMPORARY SLOPE BREAKERS
EC-8	ES-0018	PERMANENT SLOPE BREAKERS
EC-9	ES-0019	CHEVRON SLOPE BREAKER
EC-10	ES-0020	TRENCH BREAKER DETAIL (SACK)
EC-11	ES-0021	TRENCH BREAKER DETAIL (FOAM)
EC-12	ES-0022	PERMANENT TRENCH BREAKER OPTIONS
EC-13	ES-0023	EROSION CONTROL FABRIC INSTALLATION
EC-14	ES-0024	TYPICAL EROSION CONTROL BLANKETS ON SLOPES
WATER DISCHARGES (WD)		
WD-1	ES-0025	FILTER BAG
WD-2	ES-0026	DISCHARGE STRUCTURE FOR HYDROSTATIC TEST WATER
WD-3	ES-0027	OPTIONS FOR SMALL WATER DISCHARGES
WD-4	ES-0028	DISCHARGE OF HYDROSTATIC TEST WATER TO A SURFACE WATER
BRIDGES (BR)		
BR-1	ES-0029	TEMPORARY EQUIPMENT BRIDGE (EQUIPMENT PADS WITH OR WITHOUT CULVERTS)
BR-2	ES-0030	TEMPORARY EQUIPMENT BRIDGE (CRUSHED STONE WITH CULVERTS)
BR-3	ES-0031	TEMPORARY EQUIPMENT BRIDGE (FLEXI-FLOAT OR PORTABLE BRIDGE)
WATERBODY AND WETLAND CROSSINGS (WC)		
WC-1	ES-0032	TYPICAL STANDARD WETLAND CROSSING
WC-2	ES-0033	TYPICAL WET WATERBODY CROSSING
WC-3	ES-0034	TYPICAL FLUME WATERBODY CROSSING
WC-4	ES-0035	TYPICAL DAM-AND-PUMP WATERBODY CROSSING
WC-5	ES-0036	TYPICAL EROSION CONTROL BLANKETS ON STREAMBANKS
WC-6	ES-0037	TYPICAL RIP-RAP PLACEMENT
SPECIAL USE / AGRICULTURAL AREAS (SU)		
SU-1	ES-0038	DRAIN TILE REPAIR PROCEDURE

INDEX OF FIGURES

APPENDIX A

DWG. ES-0000 REV.



CROSS-SECTION VIEW

NOTES:

1. ALL PRECONSTRUCTION CONTOURS WILL BE RE-ESTABLISHED UPON COMPLETION OF PIPE INSTALLATION. EXCEPT IN WETLANDS, A CROWN MAY BE LEFT TO ACCOUNT FOR DITCH SETTLING, AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.

2. IN COLD WATER FISHERY STREAMS, THE TOP 12" OF THE TRENCH WILL BE BACKFILLED WITH CLEAN GRAVEL OR NATIVE COBBLES UNLESS OTHERWISE SPECIFIED BY THE PERMITTING AGENCY.

	TYPICAL TRENCH DETAIL	FIGURE CW-1
		DWG. ES-0001 REV.

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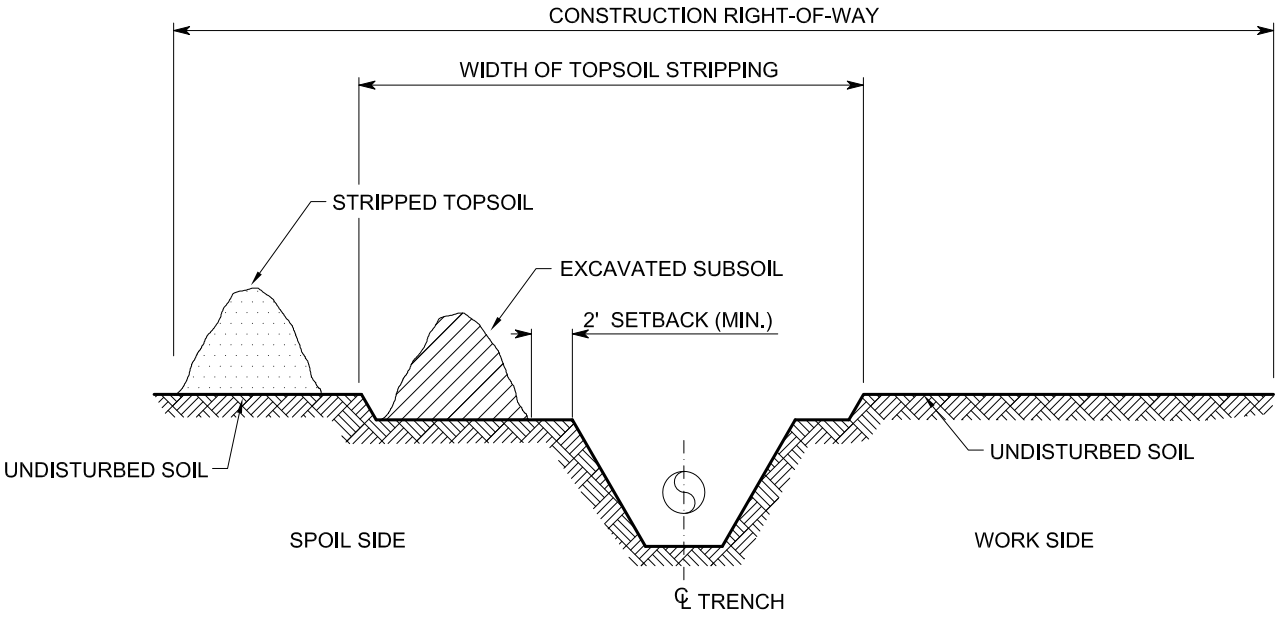
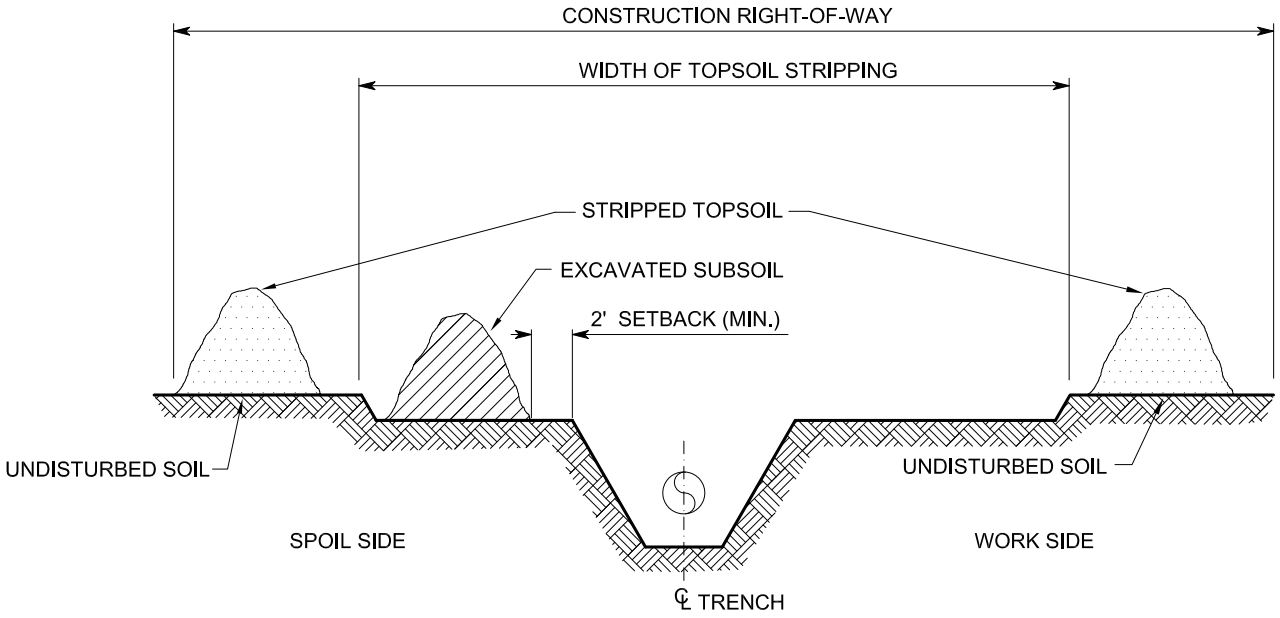


DITCH PLUS SPOILSIDE TOPSOIL SEGREGATION

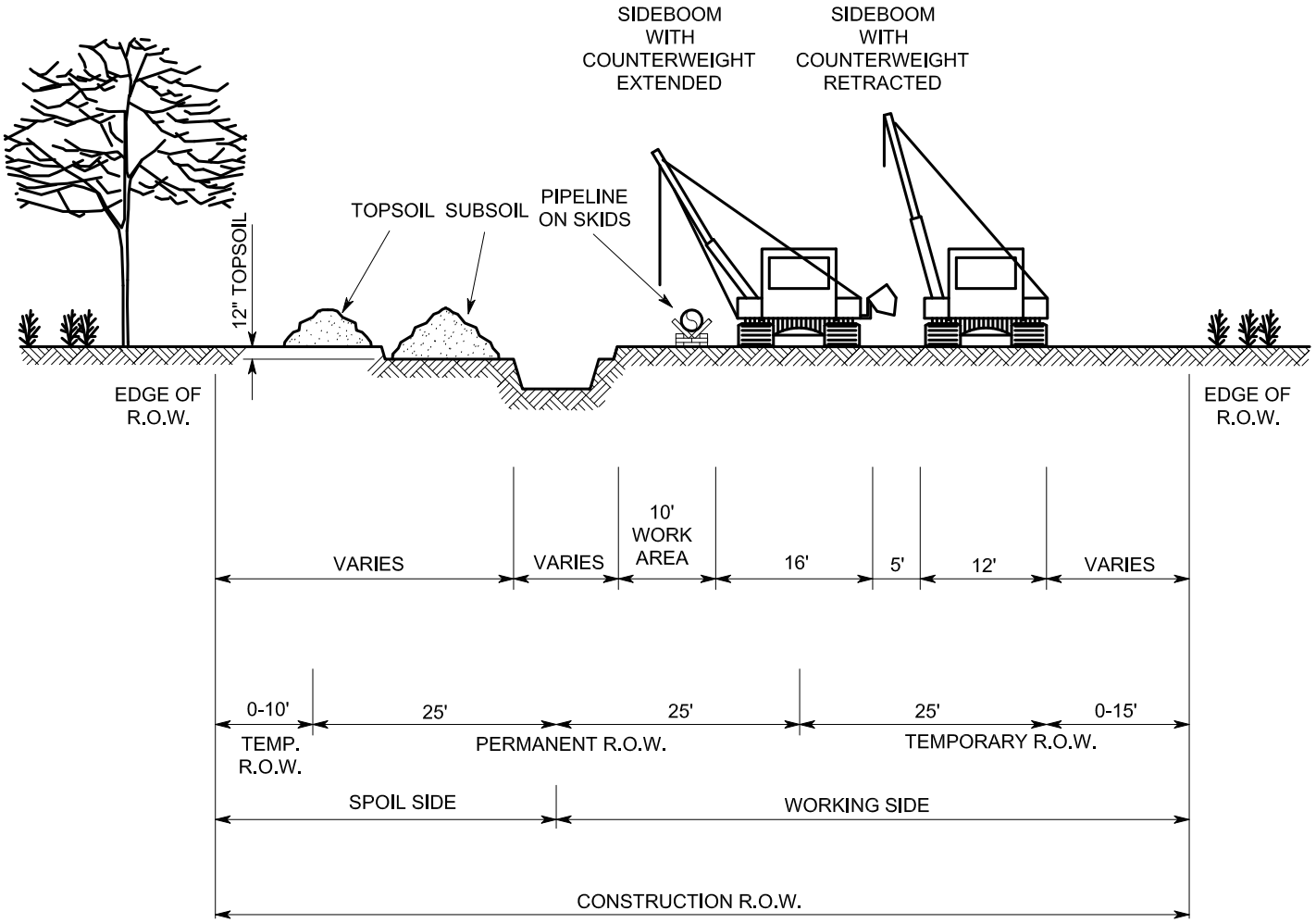


FULL RIGHT-OF-WAY TOPSOIL STRIPPING

NOTES:

1. TOPSOIL MAY BE STORED IN LOCATIONS AS SHOWN ABOVE OR AT OTHER COMPANY APPROVED LOCATIONS WITHIN THE CONSTRUCTION R.O.W.
2. LEAVE GAPS IN SPOIL PILES FOR WATER RUN-OFF.
3. MAINTAIN SEPARATION OF SALVAGED TOPSOIL AND SUBSOIL THROUGHOUT ALL CONSTRUCTION ACTIVITIES.
4. STABILIZE TOPSOIL PILES AND MINIMIZE LOSS DUE TO WATER OR WIND EROSION WITH USE OF SEDIMENT BARRIERS, MULCH, TEMPORARY SEEDING, TACKIFIERS OR FUNCTIONAL EQUIVALENTS, WHERE NECESSARY.

	RIGHT-OF-WAY TOPSOIL SEGREGATION TECHNIQUES	FIGURE CW-2
		DWG. ES-0002 REV.



PIPE DIAMETER	SPOIL SIDE (FT.)	WORKING SIDE (FT.)	CONSTRUCTION R.O.W. (FT.)
12" OR LESS	25	50	75
14" - 30"	35	50	85
36" - 42"	35	65	100
WETLANDS	25	50	75

NOTES:

1. ALTHOUGH THE DIMENSIONS SHOWN ARE TYPICAL, SOME VARIATIONS MAY EXIST DUE TO SITE SPECIFIC CONDITIONS. UNLESS OTHERWISE INDICATED ON THE ALIGNMENT SHEETS, THE MAXIMUM WIDTH OF THE CONSTRUCTION RIGHT-OF-WAY SHALL BE AS SHOWN IN THE TABLE FOR THE APPROPRIATE PIPE DIAMETER.

2. TOPSOIL SEGREGATION METHODS WILL BE USED IN ALL RESIDENTIAL AREAS AND WHEN THE CONSTRUCTION ROW IS WIDER THAN 30 FEET IN CULTIVATED OR ROTATED AGRICULTURAL LANDS, MANAGED PASTURES, HAYFIELDS, AND OTHER AREAS AT THE LANDOWNER'S OR LAND MANAGEMENT AGENCY'S REQUEST. FOR WETLANDS, SEGREGATE THE TOP 12 INCHES OF TOPSOIL WITHIN THE DITCH LINE, EXCEPT IN AREAS WHERE STANDING WATER IS PRESENT OR SOILS ARE SATURATED.

TYPICAL CONSTRUCTION WIDTHS ACQUIRING NEW PERMANENT RIGHT-OF-WAY

FIGURE CW-3

DWG. ES-0003 REV.

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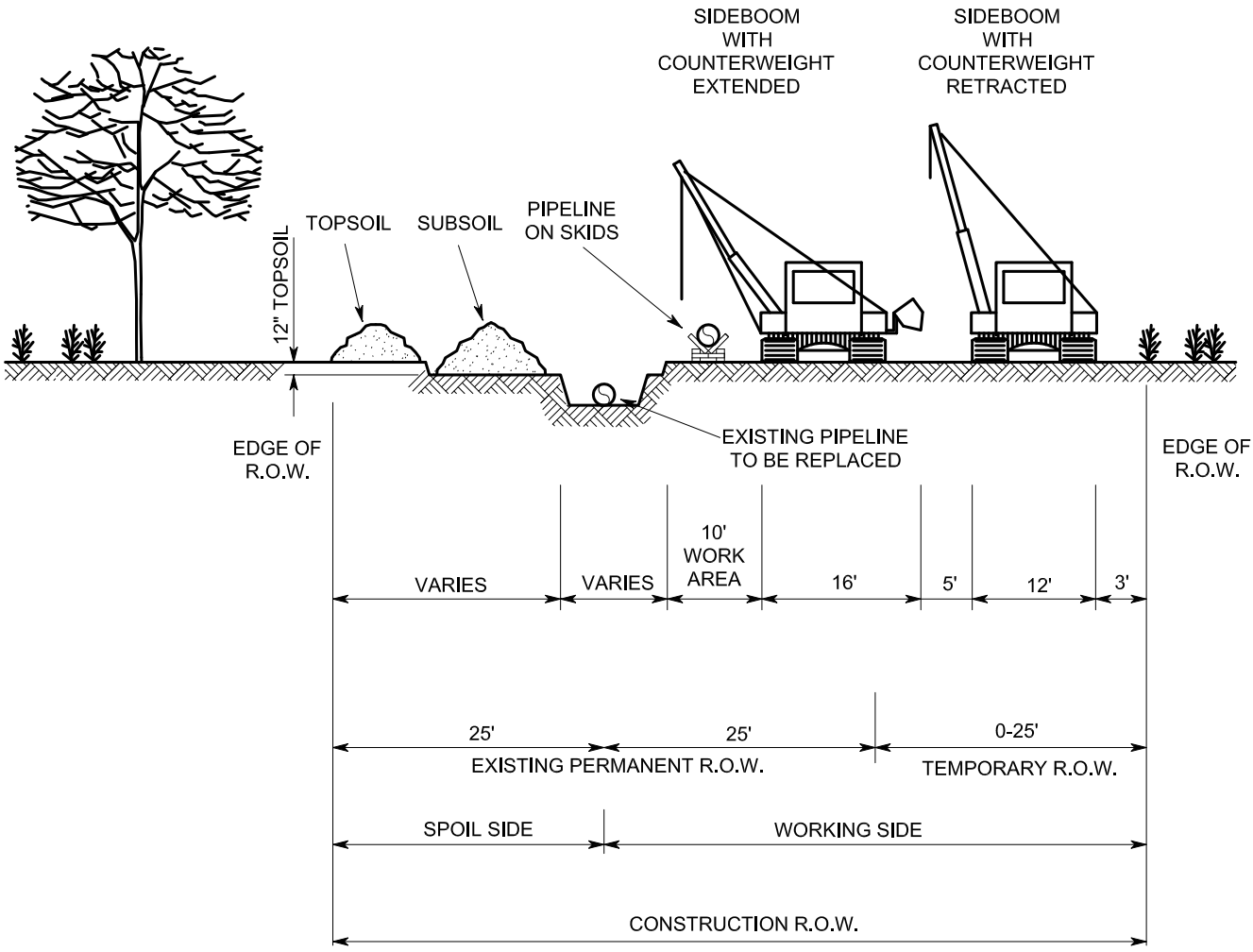


PIPE DIAMETER	SPOIL SIDE (FT.)	WORKING SIDE (FT.)	CONSTRUCTION R.O.W. (FT.)
12" OR LESS	25	25	50
14" - 30"	25	50	75
36" - 42"	25	50	75
WETLANDS	25	50	75

NOTES:

1. ALTHOUGH THE DIMENSIONS SHOWN ARE TYPICAL, SOME VARIATIONS MAY EXIST DUE TO SITE SPECIFIC CONDITIONS. UNLESS OTHERWISE INDICATED ON THE ALIGNMENT SHEETS, THE MAXIMUM WIDTH OF THE CONSTRUCTION RIGHT-OF-WAY SHALL BE AS SHOWN IN THE TABLE FOR THE APPROPRIATE PIPE DIAMETER.

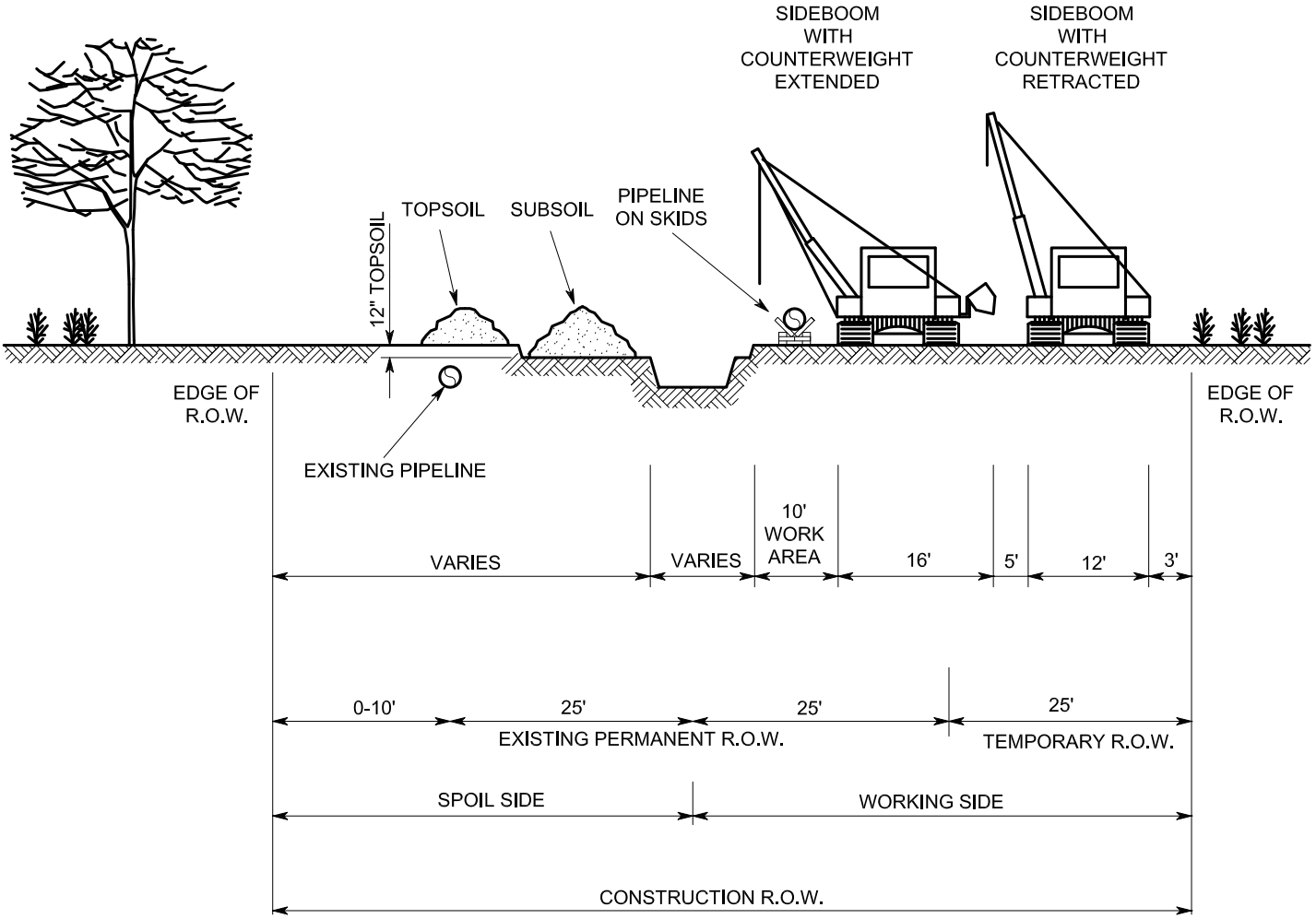
2. TOPSOIL SEGREGATION METHODS WILL BE USED IN ALL RESIDENTIAL AREAS AND WHEN THE CONSTRUCTION ROW IS WIDER THAN 30 FEET IN CULTIVATED OR ROTATED AGRICULTURAL LANDS, MANAGED PASTURES, HAYFIELDS, AND OTHER AREAS AT THE LANDOWNER'S OR LAND MANAGEMENT AGENCY'S REQUEST. FOR WETLANDS, SEGREGATE THE TOP 12 INCHES OF TOPSOIL WITHIN THE DITCH LINE, EXCEPT IN AREAS WHERE STANDING WATER IS PRESENT OR SOILS ARE SATURATED.

3. IF THE WORKING SIDE MUST BE GREATER THAN THE VALUES SHOWN IN THE TABLE, COMPANY MUST REQUEST APPROVAL FROM THE F.E.R.C.

TYPICAL CONSTRUCTION WIDTHS NOT ACQUIRING NEW PERMANENT RIGHT-OF-WAY (SINGLE LINE SYSTEM)

FIGURE CW-4

DWG. ES-0004 REV.



PIPE DIAMETER	SPOIL SIDE (FT.)	WORKING SIDE (FT.)	CONSTRUCTION R.O.W. (FT.)
12" OR LESS	25	50	75
14" - 30"	35	50	85
36" - 42"	35	50	85
WETLANDS	25	50	75

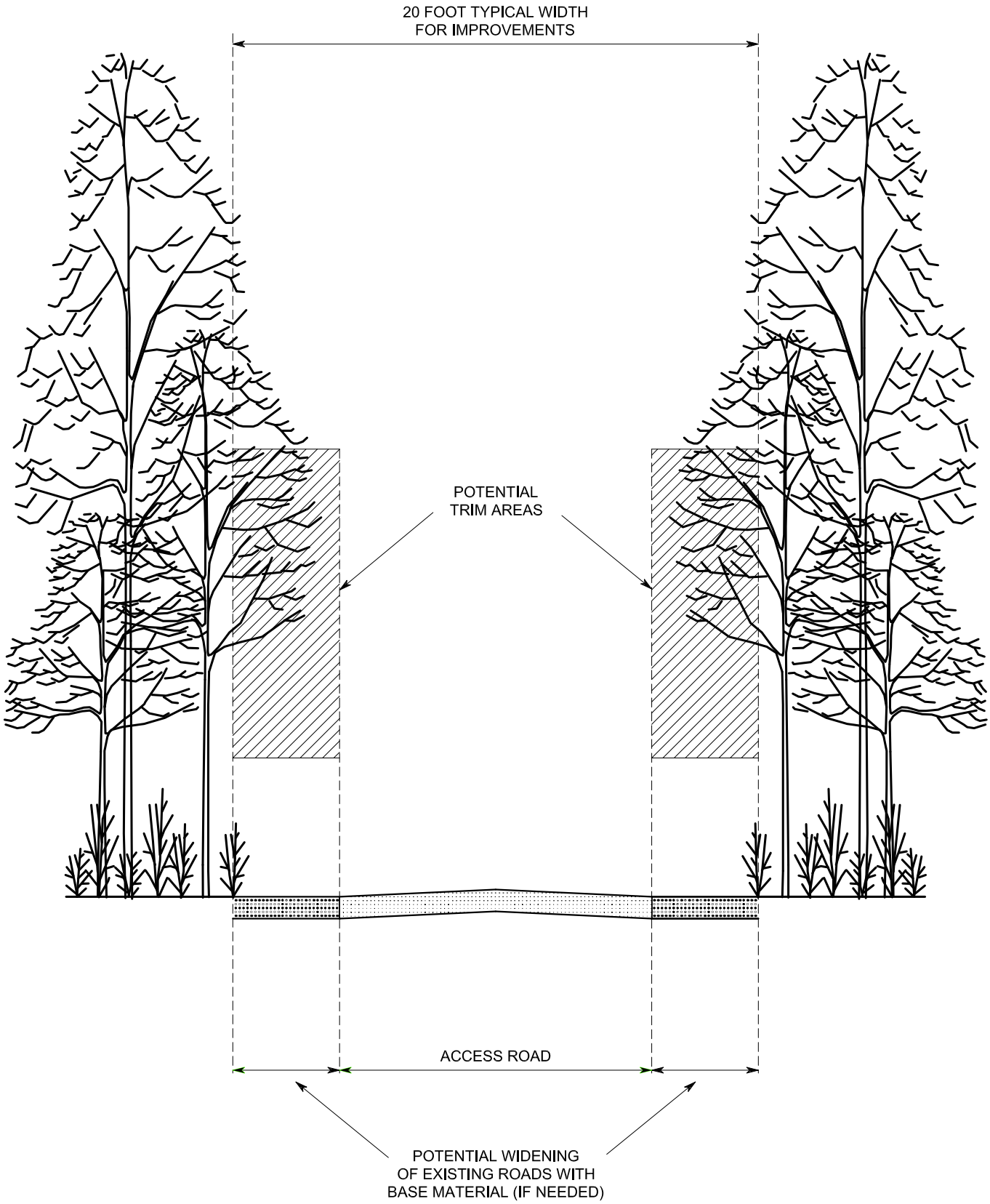
NOTES:

1. ALTHOUGH THE DIMENSIONS SHOWN ARE TYPICAL, SOME VARIATIONS MAY EXIST DUE TO SITE SPECIFIC CONDITIONS. UNLESS OTHERWISE INDICATED ON THE ALIGNMENT SHEETS, THE MAXIMUM WIDTH OF THE CONSTRUCTION RIGHT-OF-WAY SHALL BE AS SHOWN IN THE TABLE FOR THE APPROPRIATE PIPE DIAMETER.

2. TOPSOIL SEGREGATION METHODS WILL BE USED IN ALL RESIDENTIAL AREAS AND WHEN THE CONSTRUCTION ROW IS WIDER THAN 30 FEET IN CULTIVATED OR ROTATED AGRICULTURAL LANDS, MANAGED PASTURES, HAYFIELDS, AND OTHER AREAS AT THE LANDOWNER'S OR LAND MANAGEMENT AGENCY'S REQUEST. FOR WETLANDS, SEGREGATE THE TOP 12 INCHES OF TOPSOIL WITHIN THE DITCH LINE, EXCEPT IN AREAS WHERE STANDING WATER IS PRESENT OR SOILS ARE SATURATED.

3. IF THE WORKING SIDE MUST BE GREATER THAN 50 FEET (i.e. TEMPORARY WORKSPACE IS GREATER THAN 25 FEET), COMPANY MUST REQUEST APPROVAL FROM THE F.E.R.C.

	TYPICAL CONSTRUCTION WIDTHS NOT ACQUIRING NEW PERMANENT RIGHT-OF-WAY (MULTIPLE LINE SYSTEM)	FIGURE CW-5
		DWG. ES-0005 REV.



ACCESS ROAD CROSS SECTION

FIGURE RD-1

DWG. ES-0006 REV.

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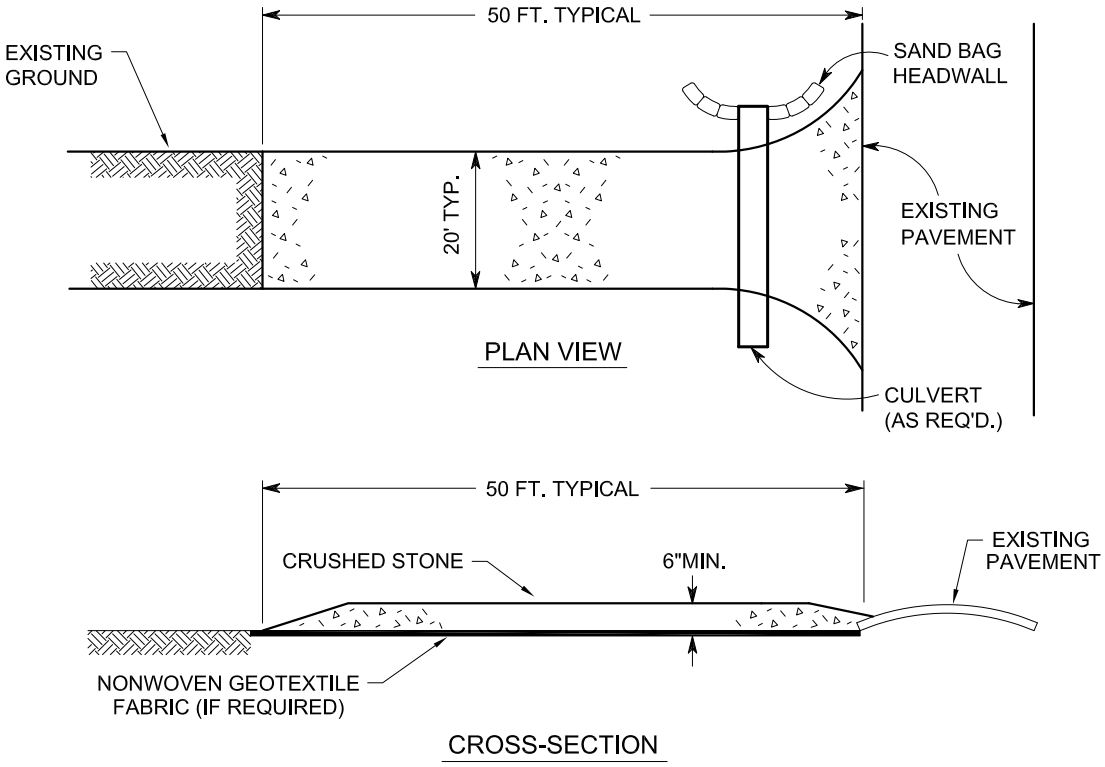
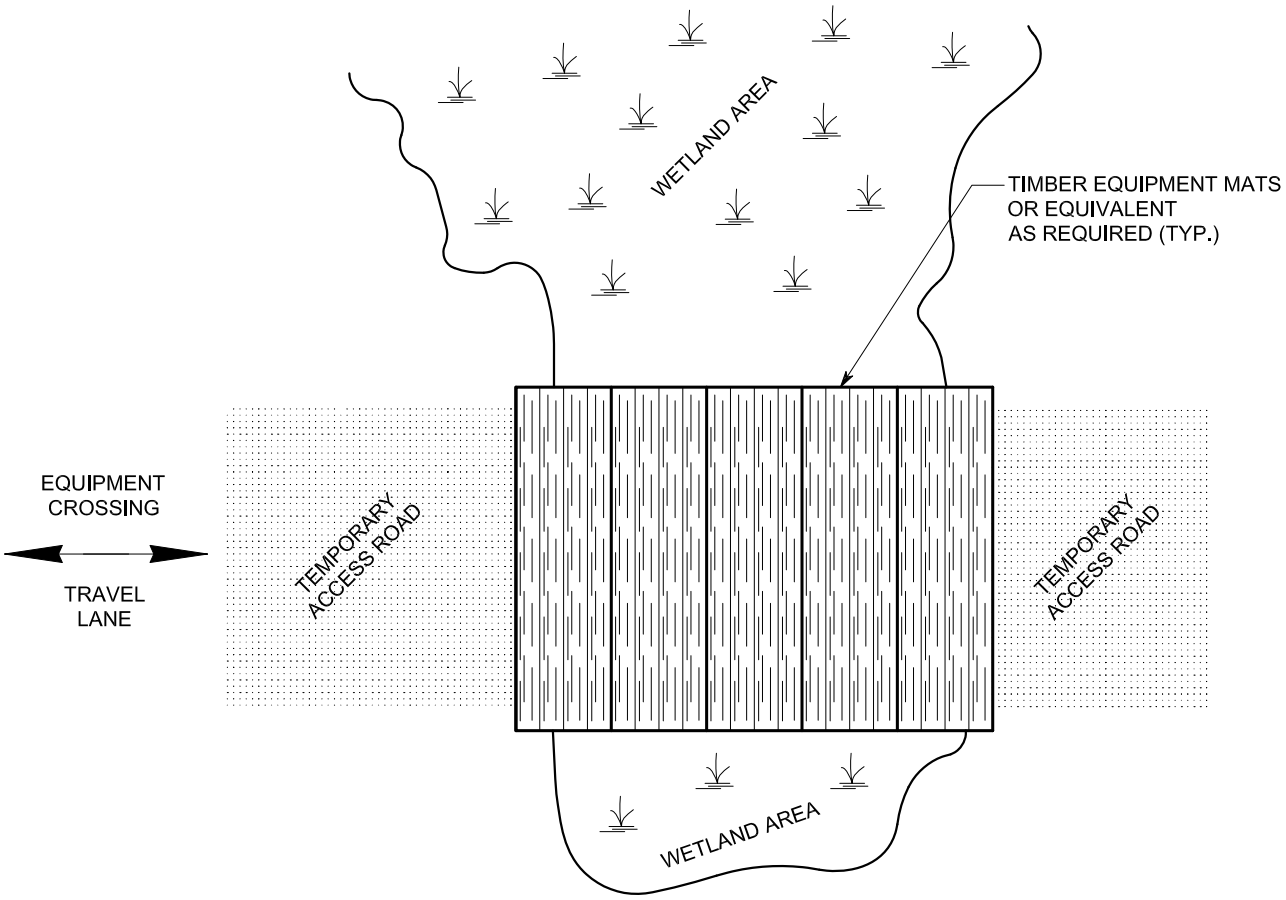


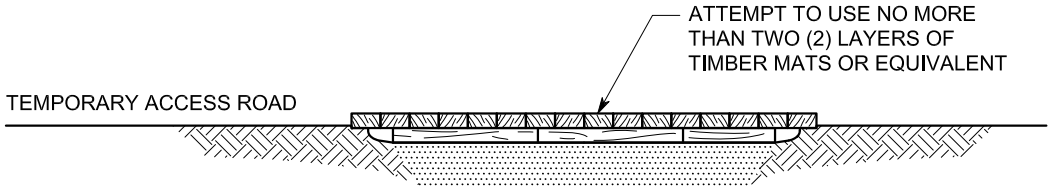
CONSTRUCTION SPECIFICATIONS:

1. STONE SIZE = 4" - 6" AVG. DIAMETER
2. ALL STONE MUST BE PLACED ON NON-WOVEN GEOTEXILE FABRIC IF USED IN RESIDENTIAL OR AGRICULTURAL AREAS.
3. LENGTH = FIFTY (50) FOOT TYPICAL (IF SITE CONDITIONS ALLOW)
4. WIDTH = TWENTY (20) FOOT TYPICAL.
5. THICKNESS = SIX (6) INCHES MINIMUM.
6. ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A DRIVEABLE BERM OR OTHER TEMPORARY EROSION CONTROL DEVICE CAN BE USED.
7. THE ENTRANCE SHALL BE PERIODICALLY INSPECTED AND MAINTAINED IN A CONDITION THAT MINIMIZES TRACKING OR FLOWING OF SEDIMENT ONTO ROADWAYS. MAINTENANCE MAY INCLUDE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR THE REPAIR / CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ANY SEDIMENT THAT IS SPILLED, DROPPED, WASHED OR TRACKED ONTO ROADWAYS MUST BE REMOVED AS SOON AS PRACTICAL.

	ROCK ACCESS PAD	FIGURE RD-2
		DWG. ES-0007 REV.



PLAN VIEW
NOT TO SCALE



CROSS-SECTION
NOT TO SCALE

NOTE:

1. SILT FENCE OR STRAW BALES MAY BE USED, AS NECESSARY, TO PREVENT SEDIMENT FROM MIGRATING OUTSIDE OF ACCESS ROAD LIMITS.

	TYPICAL TEMPORARY ACCESS ROAD THROUGH WETLANDS	FIGURE RD-3
		DWG. ES-0008 REV.

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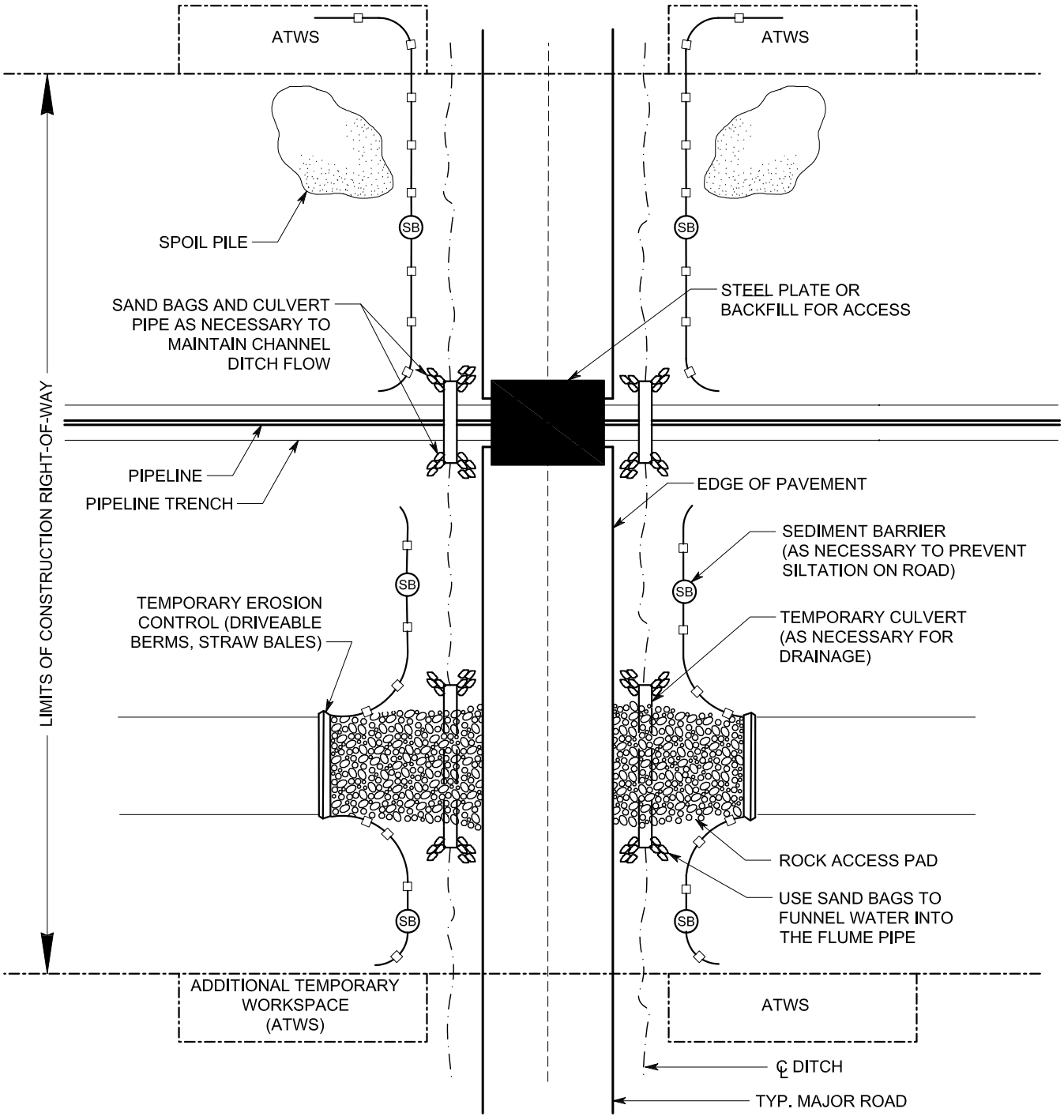

NOTES:

1. FIRST LAY SAND BAGS IN DITCH, THEN PLACE END OF CULVERT IN THE MIDDLE OF THE SAND BAGS BEFORE BUILDING HEAD WALLS TO CULVERT.
2. (SB) TEMPORARY SEDIMENT BARRIER OF SILT FENCE AND/OR STRAW BALES, OR OTHER APPROPRIATE MATERIALS.

	TYPICAL PAVED ROAD CROSSING CONTROL MEASURES (OPEN CUT)	FIGURE RD-4
		DWG. ES-0009 REV.

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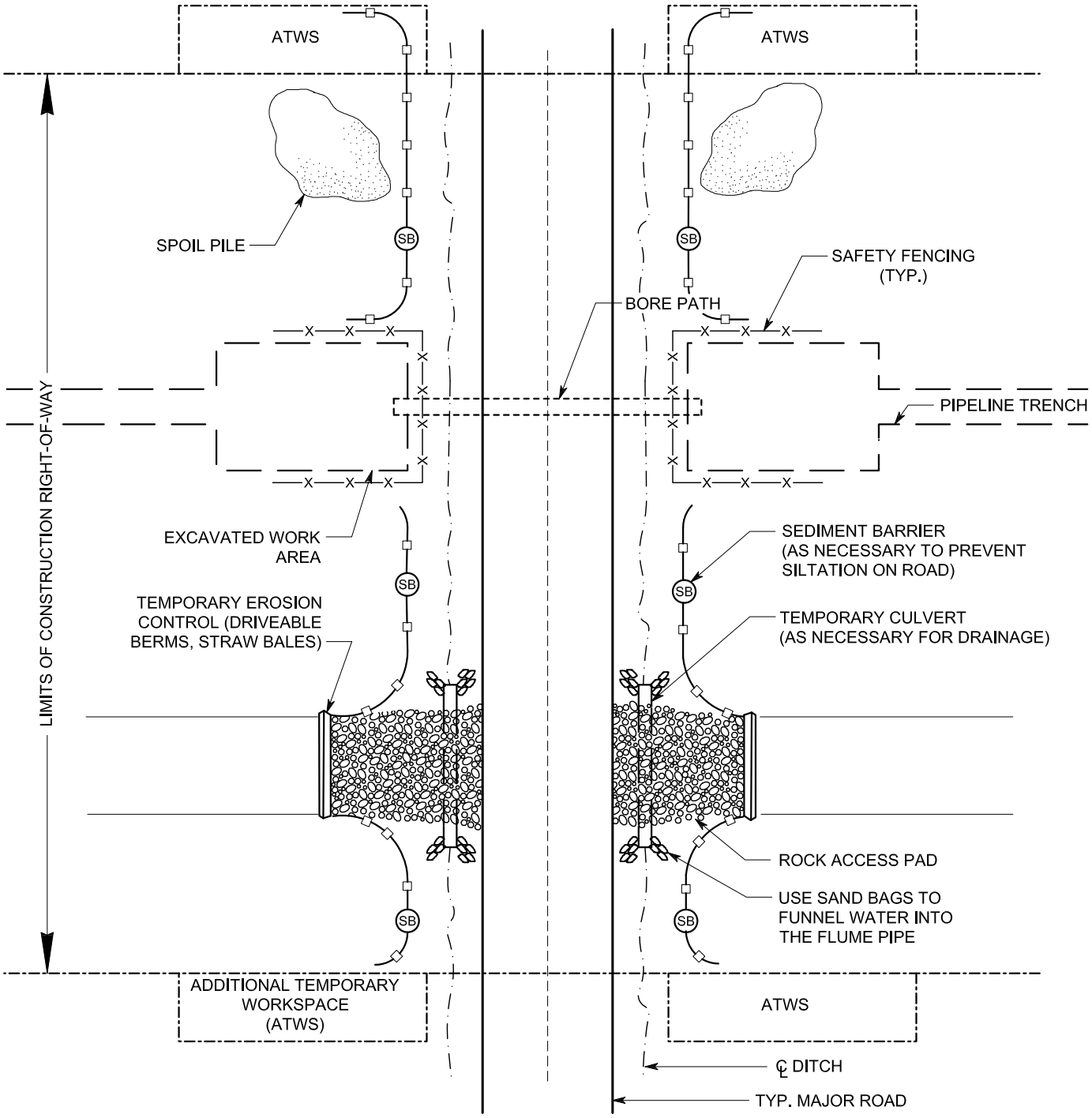
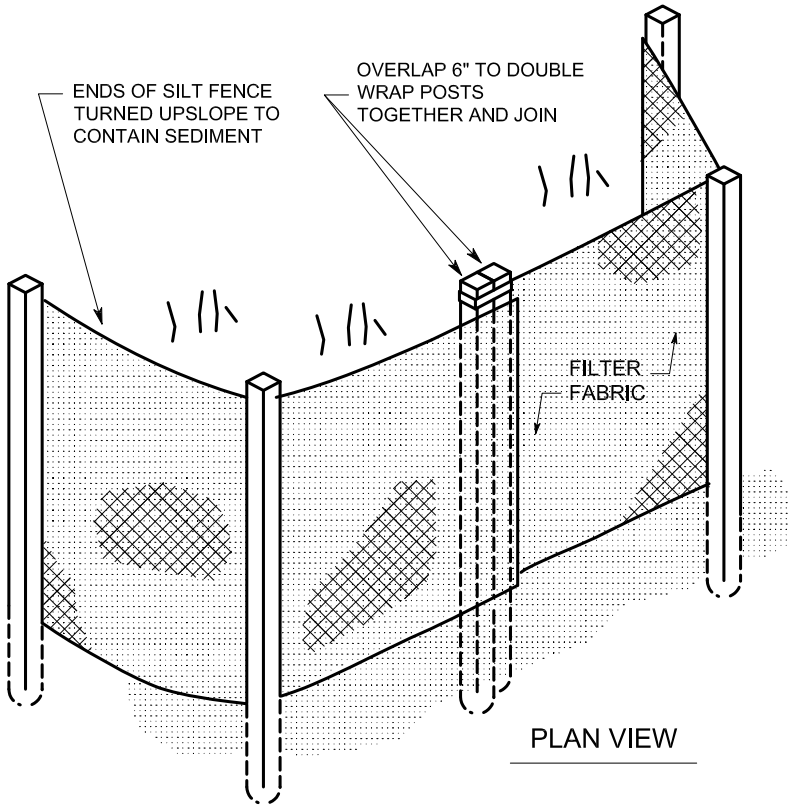


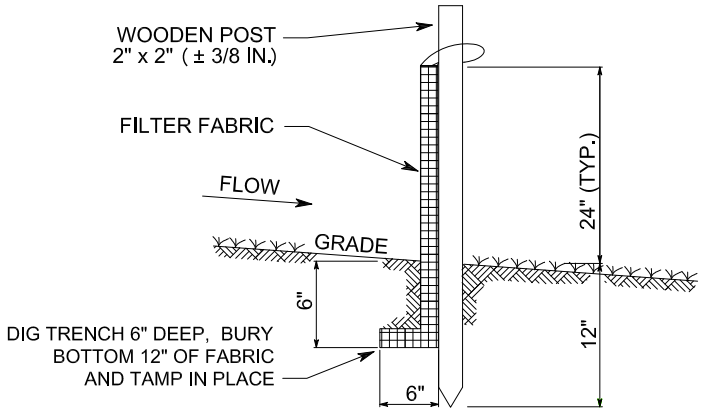
NOTES:

1. BORE PIT DIMENSIONS WILL BE DICTATED BY SITE-SPECIFIC CONDITIONS (E.G. SOIL TYPE, WIDTH OF ROAD, DEPTH OF COVER).
2. (SB) TEMPORARY SEDIMENT BARRIER OF SILT FENCE AND/OR STRAW BALES, OR OTHER APPROPRIATE MATERIALS.

	TYPICAL PAVED ROAD CROSSING CONTROL MEASURES (BORED)	FIGURE RD-5
		DWG. ES-0010 REV.



PLAN VIEW



CROSS SECTION

INSTALLATION REQUIREMENTS:

- WHEN USING SILT FENCE, PLACE IT:
  - BETWEEN DISTURBED AREAS AND DOWN-SLOPE ENVIRONMENTAL RESOURCE AREAS
  - AT THE BASE OF ALL SLOPES NEXT TO WETLANDS, WATERBODIES, AND ROAD CROSSINGS
  - AT THE INLET AND OUTLET OF OPEN DRAINAGE STRUCTURES
  - APPROXIMATELY 8 FEET BEYOND THE TOE OF THE SLOPE TO GIVE THE SEDIMENT ROOM TO COLLECT (IF POSSIBLE)
- USE SANDBAGS OR BACKFILLING TO KEY IN THE BOTTOM OF THE FABRIC WHERE IT IS NOT FEASIBLE TO TRENCH IT IN (LEDGES, ROCKY SOIL, LARGE ROOTS, ETC.)

MAINTENANCE REQUIREMENTS:

- INSPECT SILT FENCE:
  - DAILY IN AREAS OF ACTIVE CONSTRUCTION
  - WEEKLY IN AREAS WITH NO CONSTRUCTION
  - WITHIN 24 HOURS FOLLOWING EACH RAINFALL EVENT OF ≥ 0.5 INCH.
- REPAIR OR REPLACE SILT FENCE AS NEEDED
- REMOVE ACCUMULATED SEDIMENTS TO AN UPLAND AREA WHEN SEDIMENT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE SILT FENCE.

	SILT FENCE DETAIL	FIGURE EC-1
		DWG. ES-0011 REV.

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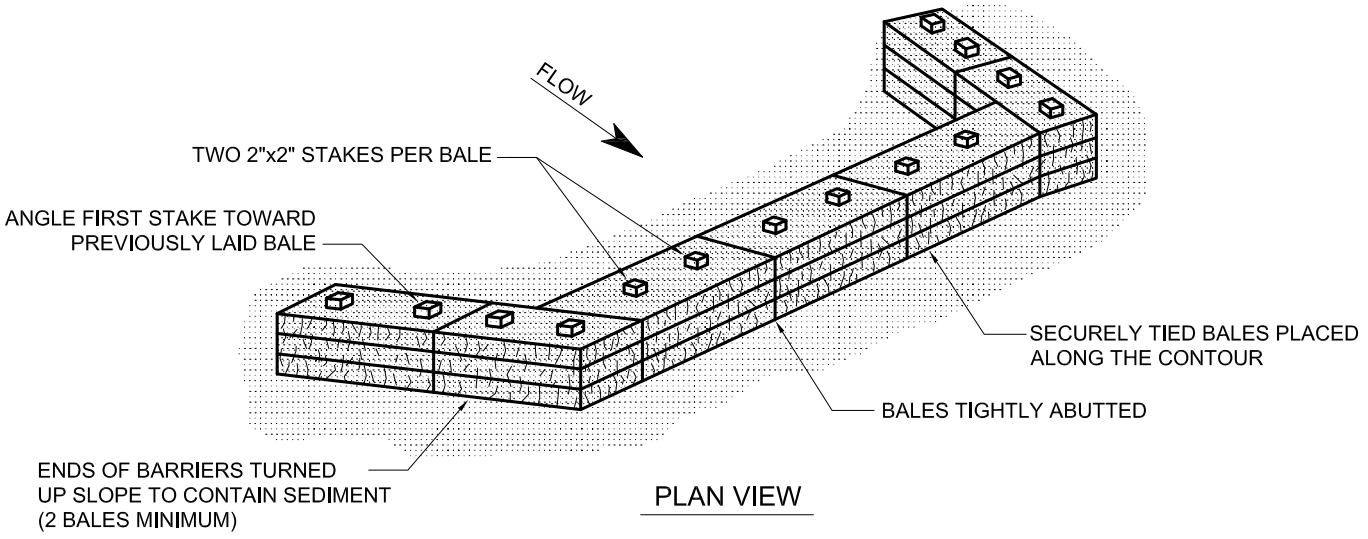
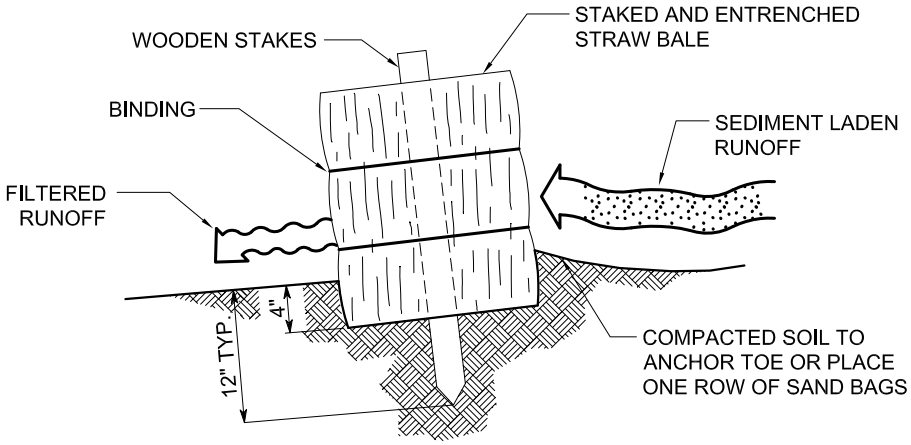


PLAN VIEW



CROSS-SECTION

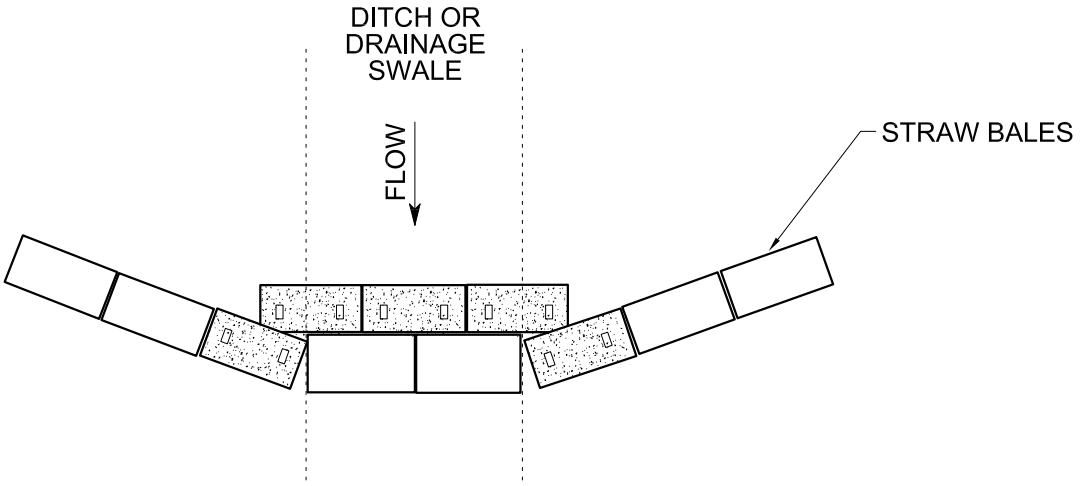
INSTALLATION REQUIREMENTS:

- WHEN USING STRAW BALES, PLACE THEM:
  - WITH THEIR ENDS TIGHTLY ABUTTING AND EMBEDDED IN THE SOIL A TYPICAL OF 4".
  - BETWEEN DISTURBED AREAS AND DOWN-SLOPE ENVIRONMENTAL RESOURCE AREAS.
  - AT THE BASE OF ALL SLOPES NEXT TO WETLANDS, WATERBODIES, AND ROAD CROSSINGS
  - AT THE INLET AND OUTLET OF OPEN DRAINAGE STRUCTURES.
  - APPROXIMATELY 6 FEET BEYOND THE TOE OF THE SLOPE TO GIVE THE SEDIMENT ROOM TO COLLECT.
- KEY IN THE BOTTOM OF THE BALE. IN AREAS WHERE IT IS NOT FEASIBLE TO TRENCH IT IN (LEDGES, ROCKY SOIL, LARGE TREE ROOTS, ETC.), USE NATIVE SOIL AS BACKFILL UP-SLOPE OF THE BALE OR PLACE ONE ROW OF SAND BAGS.
- DO NOT STAKE OR TRENCH IN PLACE STRAW BALES USED ON EQUIPMENT BRIDGES OR ON MATS ACROSS THE TRAVEL LANE.
- IF USED IN CONJUNCTION WITH SILT FENCE, BALES ARE PLACED DOWNSLOPE / UPSLOPE OF THE SILT FENCE AND DO NOT NEED TO BE TRENCHED IN.

MAINTENANCE REQUIREMENTS:

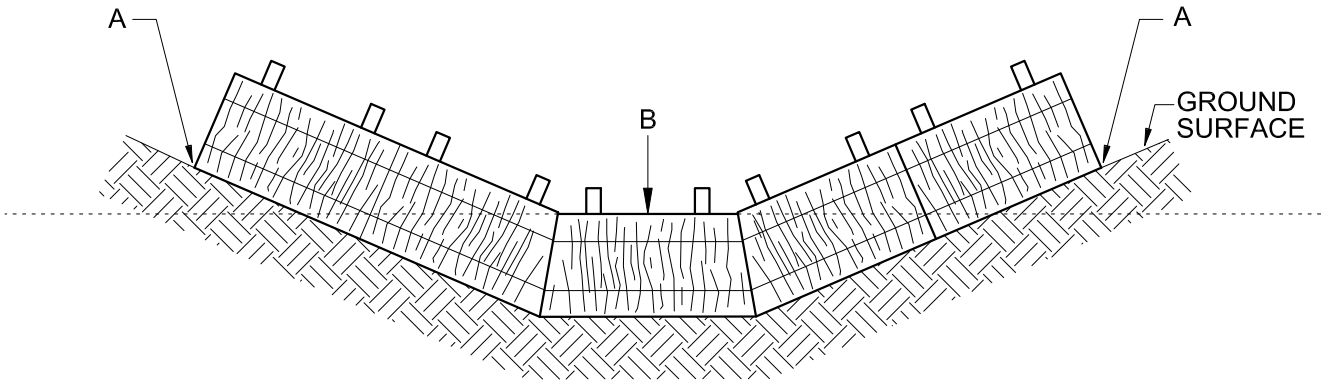
- INSPECT BALES:
  - DAILY IN AREAS OF ACTIVE CONSTRUCTION.
  - WEEKLY IN AREAS WITH NO CONSTRUCTION.
  - WITHIN 24 HOURS FOLLOWING EACH RAINFALL EVENT OF ≥ 0.5 INCH.
- REPAIR OR REPLACE BALES AS NEEDED.
- REMOVE ACCUMULATED SEDIMENTS TO AN UPLAND AREA AS NEEDED.

	STRAW BALE DETAIL	FIGURE EC-2
		DWG. ES-0012 REV.



PLAN VIEW
NOT TO SCALE

POINTS A SHALL BE HIGHER THAN POINT B



CROSS-SECTION
NOT TO SCALE

NOTE:

1. THE NUMBER OF BALES IS DETERMINED BASED ON SITE SPECIFIC FACTORS.

	STRAW BALE CHECK DAM IN A DRAINAGEWAY	FIGURE EC-3
		DWG. ES-0013 REV.

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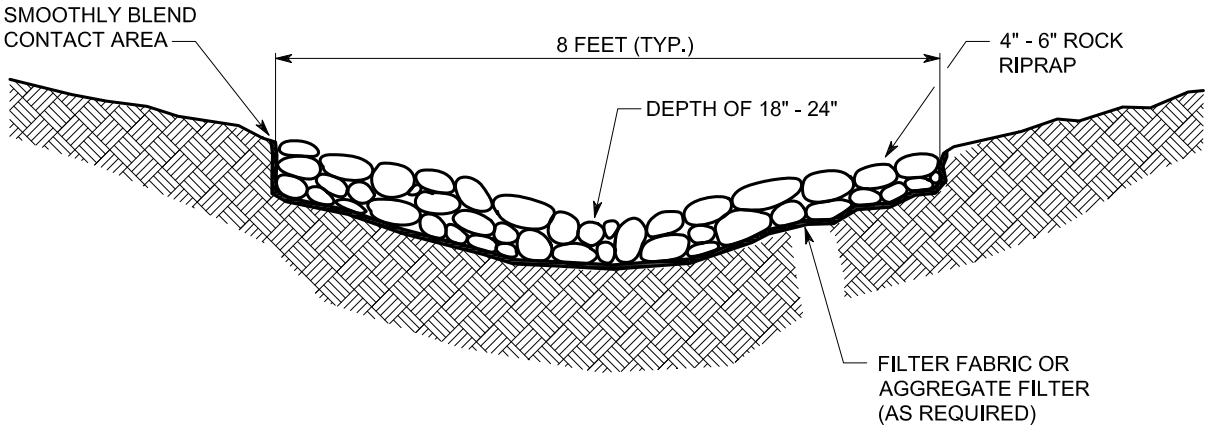


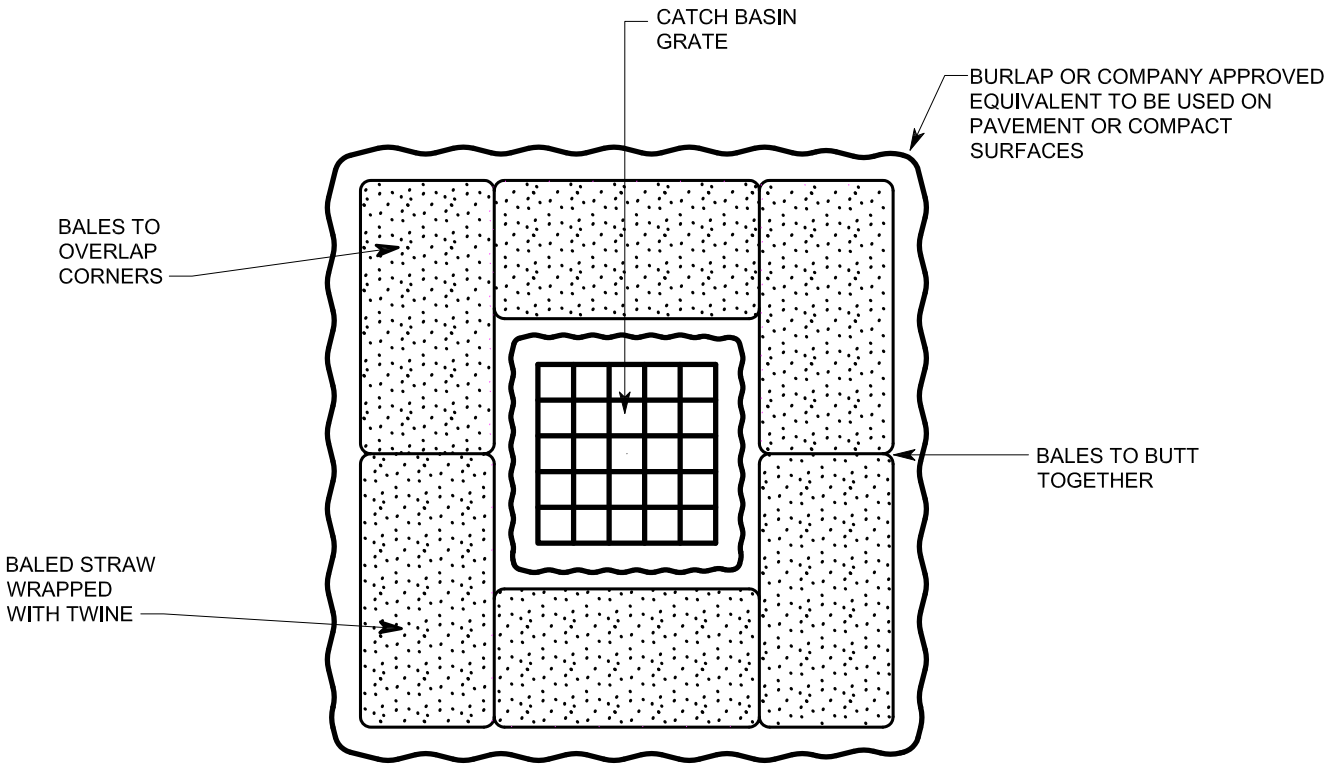
INSTALLATION REQUIREMENTS:

1. RIPRAP CHANNELS CAN BE CONSTRUCTED WITH GRASS-LINED SLOPES WHERE SITE CONDITIONS WARRANT.
2. STABILIZE CHANNEL INLET POINTS AND INSTALL OUTLET PROTECTION (AS NEEDED) DURING CHANNEL INSTALLATION.
3. INSTALL ENERGY DISSIPATING DEVICE (AS NEEDED) TO PREVENT SCOUR TO THE RECEIVING OUTLET.
4. REMOVE ALL TREES, BRUSH, AND OTHER OBJECTIONABLE MATERIAL FROM THE CHANNEL.
5. INSTALL FILTER FABRIC OR GRAVEL LAYER TO PREVENT PIPING (AS REQUIRED)

MAINTENANCE REQUIREMENTS:

1. INSPECT CHANNEL DURING AND FOLLOWING CONSTRUCTION AND MAKE REPAIRS AS NEEDED.
2. KEEP THE CHANNEL FREE OF DEBRIS AND OBSTRUCTIONS.

	ROCK-LINED DRAINAGE SWALE	FIGURE EC-4
		DWG. ES-0014 REV.

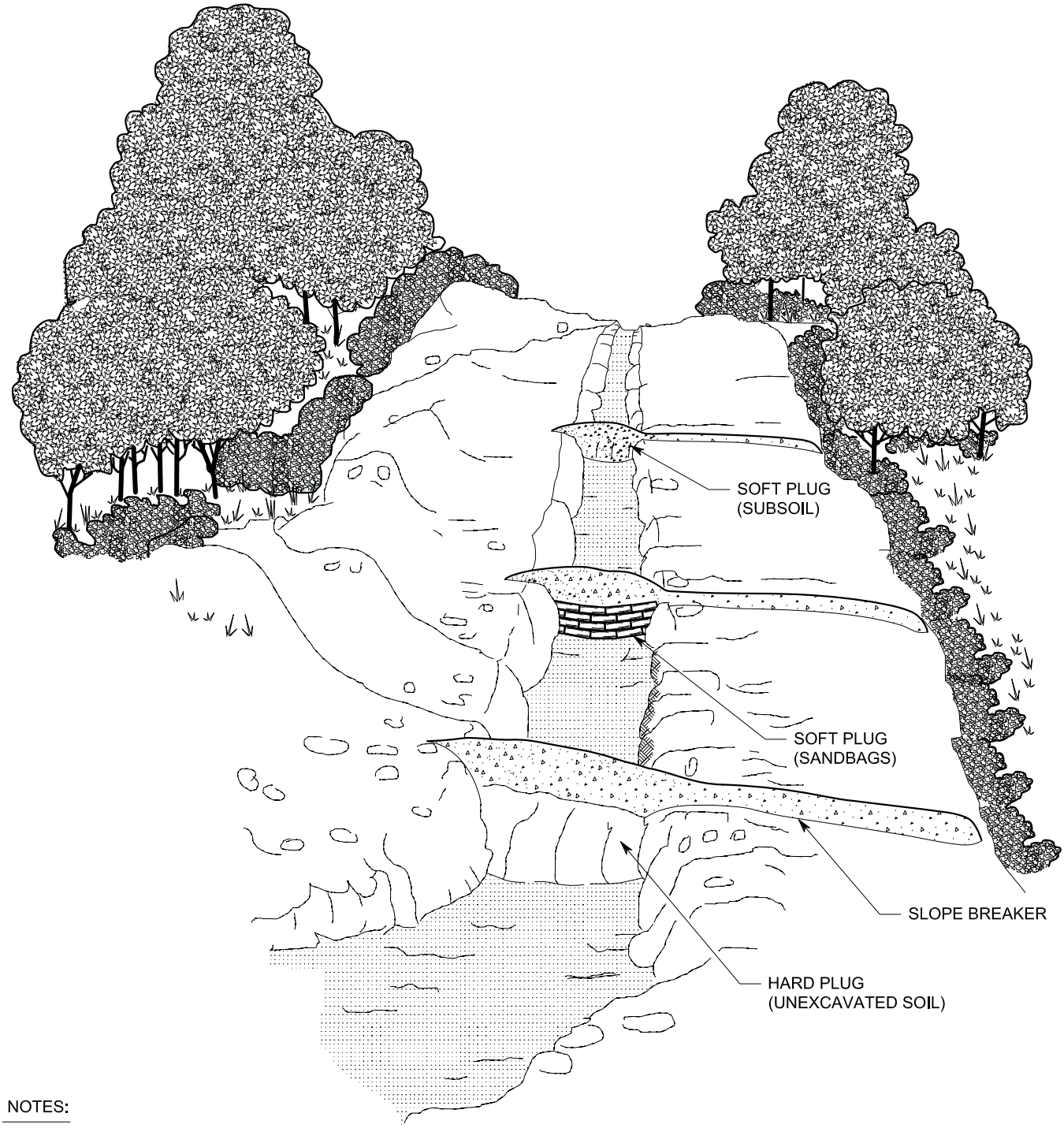


PLAN VIEW

NOTES:

1. SURROUND STREET DRAINAGE STRUCTURE INLET WITH STRAW BALES PRIOR TO CONSTRUCTION AND MAINTAIN UNTIL CONSTRUCTION IS COMPLETED.
2. FOR BALES PLACED ON PAVEMENT (OR COMPACT SURFACES), PLACE BURLAP OR COMPANY APPROVED EQUIVALENT BETWEEN PAVEMENT AND BALE.
3. REMOVE ACCUMULATED SEDIMENT.
4. AN ALTERNATIVE STORM DRAIN INLET PROTECTION MAY USE ONLY FABRIC LINING WITHOUT STRAW BALES BASED ON THE DISCRETION OF THE THE ENVIRONMENTAL INSPECTOR.

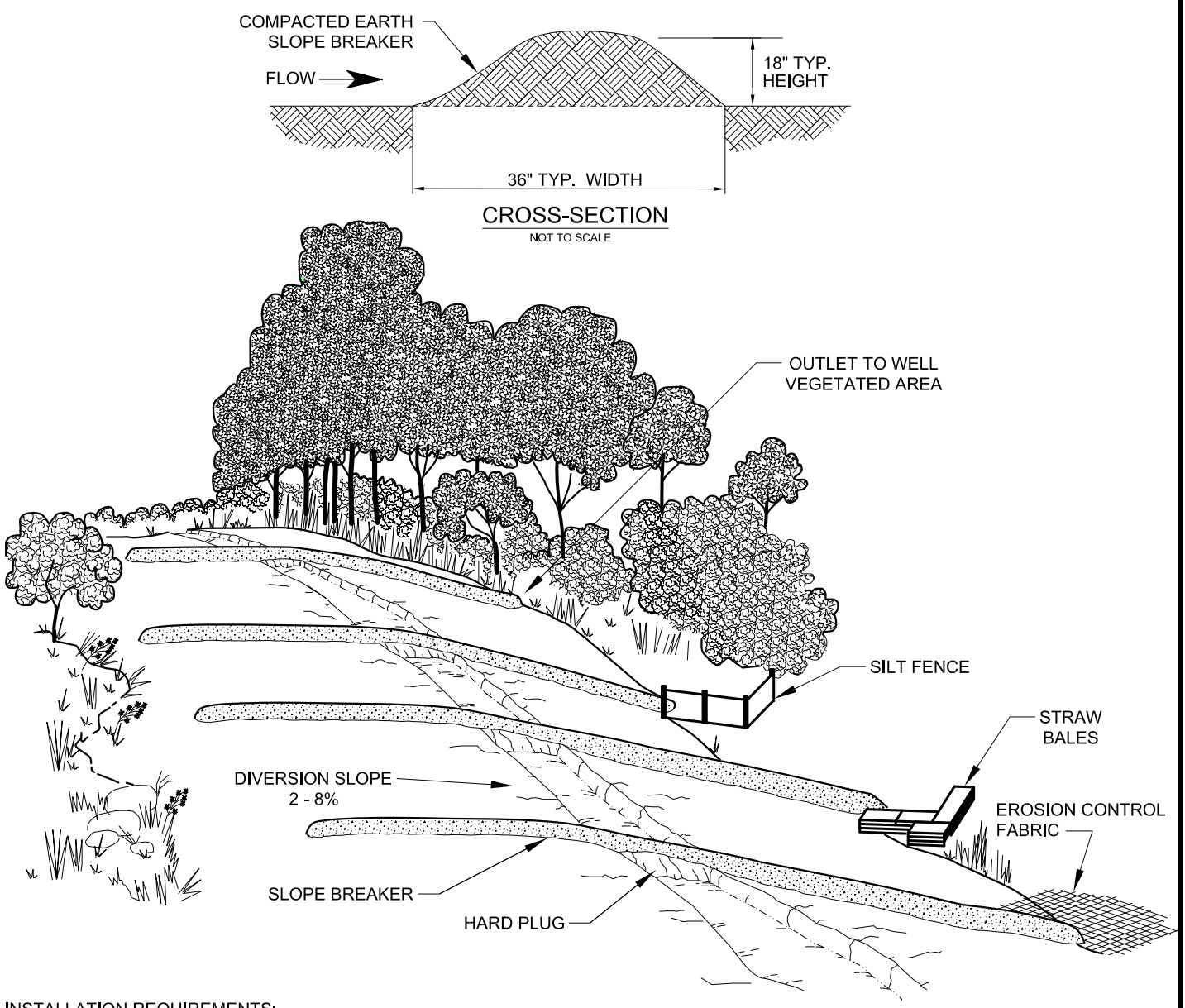
	STORM DRAIN INLET PROTECTION	FIGURE EC-5
		DWG. ES-0015 REV.



NOTES:

1. TEMPORARY TRENCH PLUG MATERIALS MAY CONSIST OF UNEXCAVATED PORTIONS OF THE TRENCH (HARD PLUG), COMPACTED SUBSOIL OR SANDBAGS PLACED ACROSS THE DITCH (SOFT PLUG), OR SOME FUNCTIONAL EQUIVALENT. THESE OPTIONS ARE DEPICTED ABOVE. DO NO USE TOPSOIL FOR TRENCH PLUGS.
2. POSITION TEMPORARY TRENCH PLUGS, AS NECESSARY, TO REDUCE TRENCHLINE EROSION AND MINIMIZE THE VOLUME AND VELOCITY OF TRENCH WATER FLOW AT THE BASE OF SLOPES.
3. TEMPORARY TRENCH PLUGS MAY BE USED IN CONJUNCTION WITH SLOPE BREAKERS TO DIVERT TRENCH WATER OVERFLOW AND PREVENT OVERFLOW INTO SENSITIVE RESOURCE AREAS.
4. DIVERT TRENCH OVERFLOW TO A WELL-VEGETATED OFF-R.O.W. LOCATION OR INSTALL APPROPRIATE ENERGY DISSIPATING DEVICE.
5. USE TEMPORARY TRENCH PLUGS AT WATERBODY CROSSINGS, AS NECESSARY.

	TEMPORARY TRENCH PLUG OPTIONS	FIGURE EC-6
		DWG. ES-0016 REV.



INSTALLATION REQUIREMENTS:

- INSTALL SLOPE BREAKERS IN ALL DISTURBED AREAS AS NECESSARY TO AVOID EXCESSIVE EROSION AT THE LOCATIONS SHOWN ON THE CONSTRUCTION DRAWINGS OR AS APPROVED BY THE ENVIRONMENTAL INSPECTOR (EI).
- MUST BE INSTALLED ON SLOPES GREATER THAN 5% WHERE THE BASE OF THE SLOPE IS LESS THAN 50 FEET FROM A WATERBODY, WETLAND OR ROAD CROSSING AT THE FOLLOWING MINIMUM SPACING:

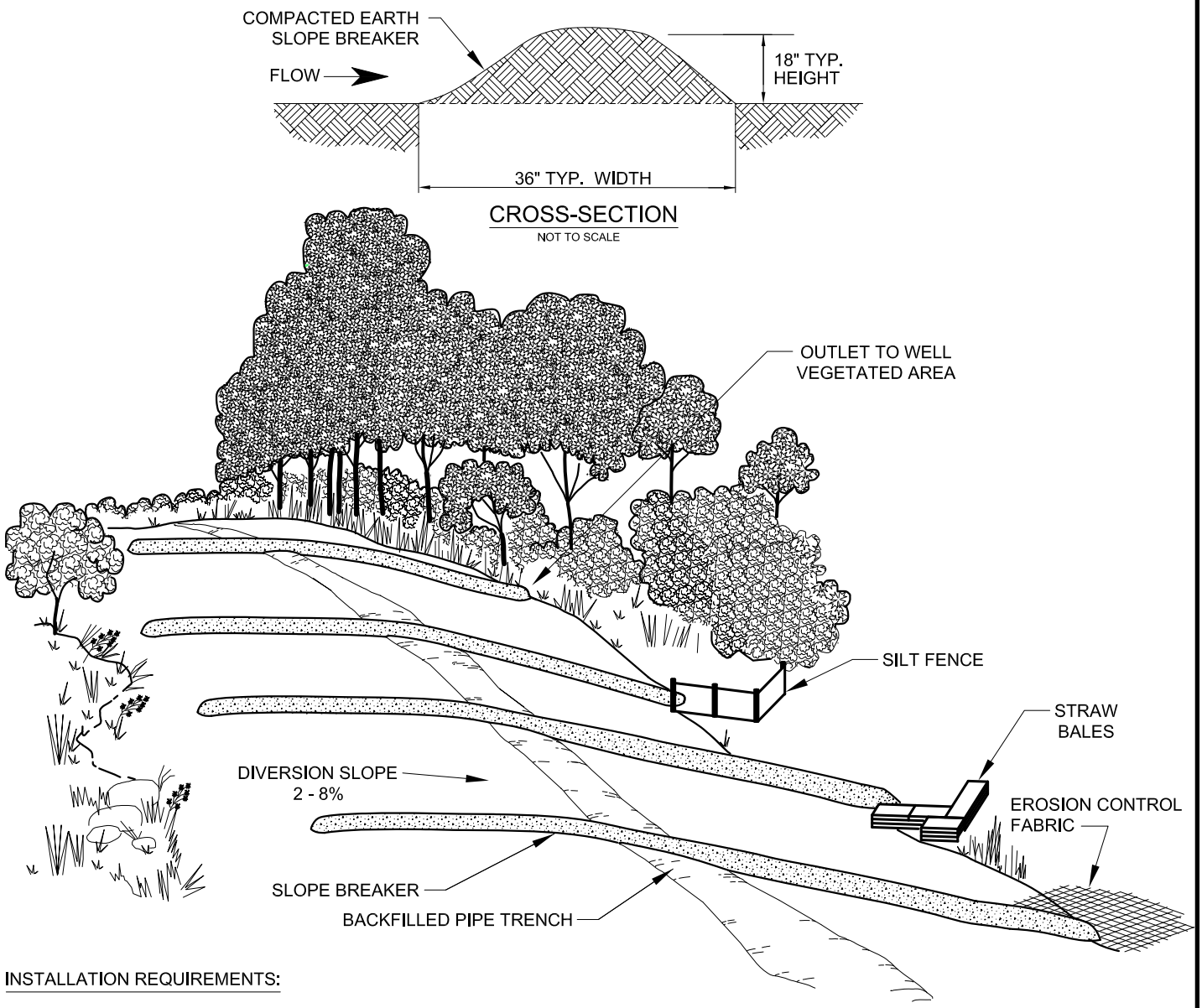
SLOPE (%)	SPACING (FT.)
5 - 15	300
> 15 - 30	200
> 30	100

- CONSTRUCT USING SAND BAGS, STAKED STRAW BALES, SILT FENCE, OR SOIL.
- INSTALL WITH A 2 - 8% OUTFALL ANGLE.
- POSITION OUTFALL TO PREVENT SEDIMENT DISCHARGE INTO WETLANDS, WATERBODIES, OR OTHER SENSITIVE RESOURCES.
- FILTER RUN-OFF WATER BY CONSTRUCTING THE OUTLET IN A WELL VEGETATED STABLE AREA, OR BY USING AN ENERGY DISSIPATING DEVICE (SILT FENCE, STRAW BALES, EROSION CONTROL FABRIC). IF NEEDED, THE TYPE OF ENERGY DISSIPATION DEVICE WILL DEPEND ON SITE CONDITIONS (OPTIONS ARE DEPICTED ABOVE).

MAINTENANCE REQUIREMENTS:

- INSPECT DURING CONSTRUCTION AND MAKE REPAIRS AS NEEDED.
- KEEP THE CHANNEL FREE OF DEBRIS AND OBSTRUCTIONS.

	TEMPORARY SLOPE BREAKERS	FIGURE EC-7
		DWG. ES-0017 REV.



INSTALLATION REQUIREMENTS:

- INSTALL AND MAINTAIN IN ALL DISTURBED AREAS TO AVOID EXCESSIVE EROSION, EXCEPT CULTIVATED AREAS AND LAWNS (UNLESS REQUESTED BY THE LANDOWNER), USING SPACING RECOMMENDATIONS OBTAINED FROM THE LOCAL SOIL CONSERVATION AUTHORITY OR LAND MANAGEMENT AGENCY, AT THE LOCATIONS SHOWN ON THE CONSTRUCTION DRAWINGS OR AS APPROVED BY THE ENVIRONMENTAL INSPECTOR (EI).
- INSTALL ON SLOPES GREATER THAN 5% WHERE THE BASE OF THE SLOPE IS LESS THAN 50 FEET FROM A WATERBODY, WETLAND OR ROAD CROSSING AT THE FOLLOWING MINIMUM SPACING IN THE ABSENCE OF WRITTEN RECOMMENDATIONS:

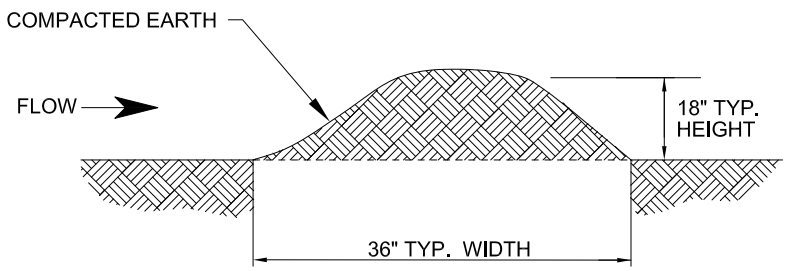
SLOPE (%)	SPACING (FT.)
5 - 15	300
> 15 - 30	200
> 30	100

- CONSTRUCT USING SOIL, STONE, OR SOME FUNCTIONAL EQUIVALENT.
- INSTALL WITH A 2 - 8% OUTFALL ANGLE.
- POSITION OUTFALL TO PREVENT SEDIMENT DISCHARGE INTO WETLANDS, WATERBODIES, OR OTHER SENSITIVE RESOURCES.
- FILTER RUN-OFF WATER BY CONSTRUCTING THE OUTLET IN A WELL VEGETATED STABLE AREA, OR BY USING AN ENERGY DISSIPATING DEVICE (SILT FENCE, STRAW BALES, EROSION CONTROL FABRIC). IF NEEDED, THE TYPE OF ENERGY DISSIPATION DEVICE WILL DEPEND ON SITE CONDITIONS (OPTIONS ARE DEPICTED ABOVE).
- IF NECESSARY, OUTFALL MAY EXTEND SLIGHTLY, UP TO 4 FEET, BEYOND THE EDGE OF THE CONSTRUCTION RIGHT-OF-WAY, SUBJECT TO ALL APPLICABLE SURVEY REQUIREMENTS.

MAINTENANCE REQUIREMENTS:

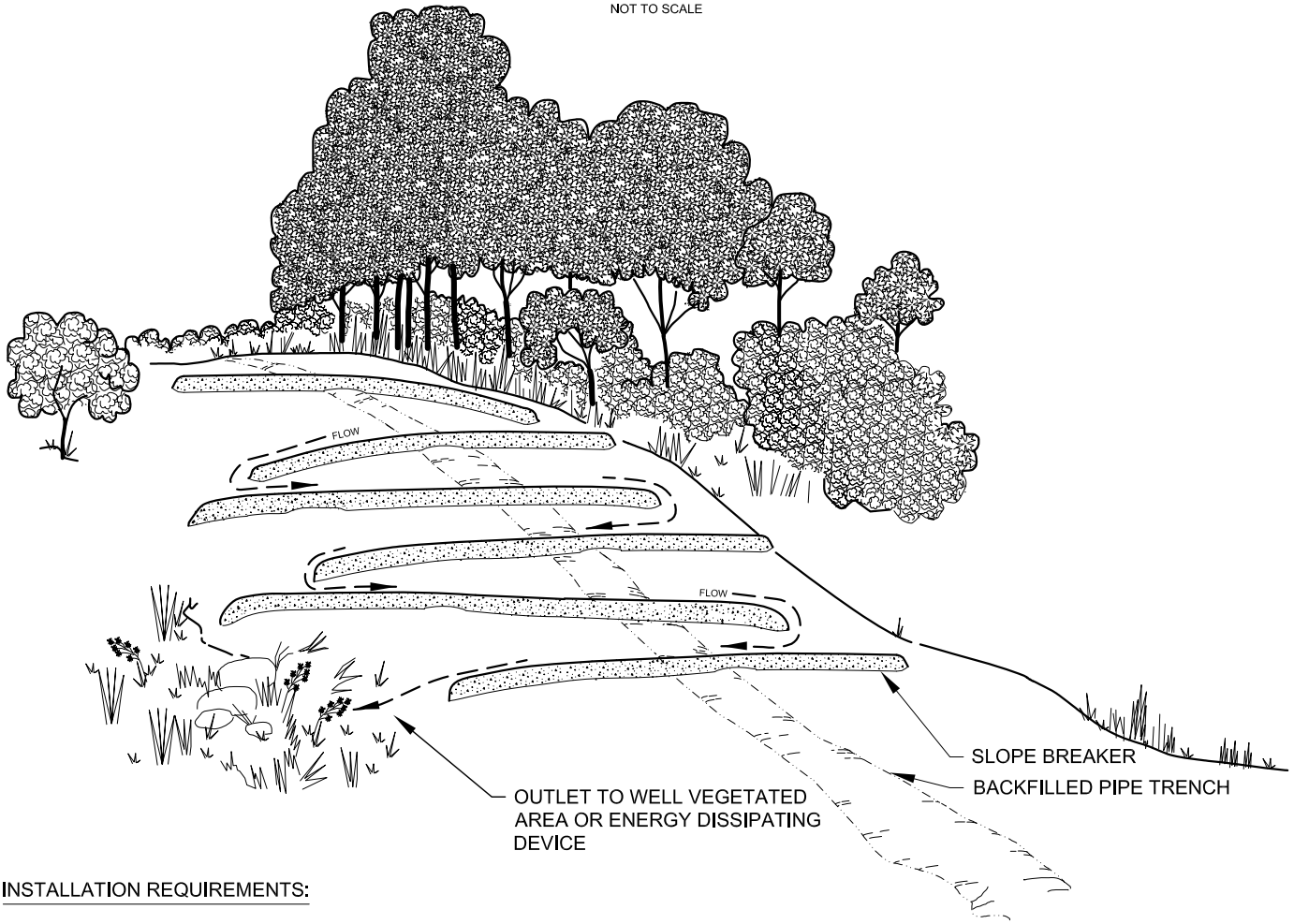
- INSPECT DURING AND FOLLOWING CONSTRUCTION AND MAKE REPAIRS AS NEEDED.
- KEEP THE CHANNEL FREE OF DEBRIS AND OBSTRUCTIONS.
- SEED AND MULCH PERMANENT SLOPE BREAKERS FOLLOWING CONSTRUCTION.

	PERMANENT SLOPE BREAKERS	FIGURE EC-8
		DWG. ES-0018 REV.



CROSS-SECTION

NOT TO SCALE



INSTALLATION REQUIREMENTS:

- INSTALL IN ALL AREAS EXCEPT RESIDENTIAL OR AGRICULTURAL (UNLESS AUTHORIZED BY LANDOWNER OR LAND MANAGING AGENCY).
- CONSTRUCT USING EARTH FILLED SACKS OR STAKED STRAW BALES FOR TEMPORARY OR COMPACTED EARTH AND ROCK FOR PERMANENT.
- INSTALL WITH A 2 - 8% OUTFALL ANGLE.
- FOR TEMPORARY CHEVRON SLOPE BREAKERS, POSITION OUTFALL TO PREVENT SEDIMENT DISCHARGE INTO WETLANDS, WATERBODIES, OR OTHER SENSITIVE RESOURCES.
- FILTER RUN-OFF WATER BY CONSTRUCTING AN OUTLET USING AN ENERGY DISSIPATING DEVICE (SILT FENCE, STRAW BALES, EROSION CONTROL FABRIC), AS APPROVED BY THE ENVIRONMENTAL INSPECTOR.

MAINTENANCE REQUIREMENTS:

- INSPECT DURING AND FOLLOWING CONSTRUCTION AND MAKE REPAIRS AS NEEDED.
- KEEP THE CHANNEL FREE OF DEBRIS AND OBSTRUCTIONS.
- SEED AND MULCH PERMANENT SLOPE BREAKERS FOLLOWING CONSTRUCTION.

	CHEVRON SLOPE BREAKER	FIGURE EC-9
		DWG. ES-0019 REV.

I.G. ES0019.DWG

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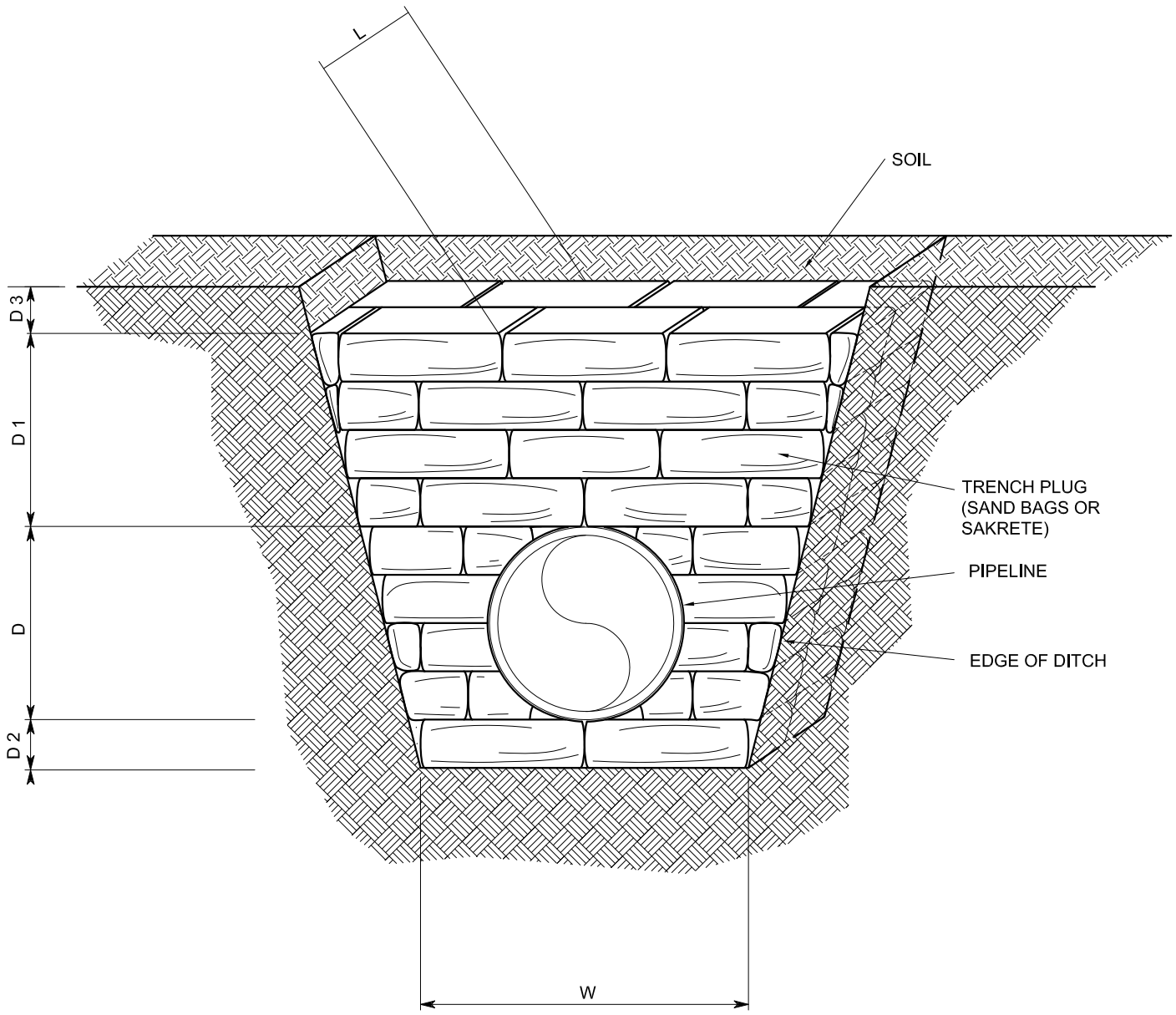


D = PIPE DIAMETER
D1 = APPROXIMATELY 24"
D2 = APPROXIMATELY 6" (8" MIN. IN ROCK)
D3 = APPROXIMATELY 12"
W = D + 2 to 4 FEET
L = APPROXIMATELY 18" - 24"
D1 + D3 = 36" MINIMUM

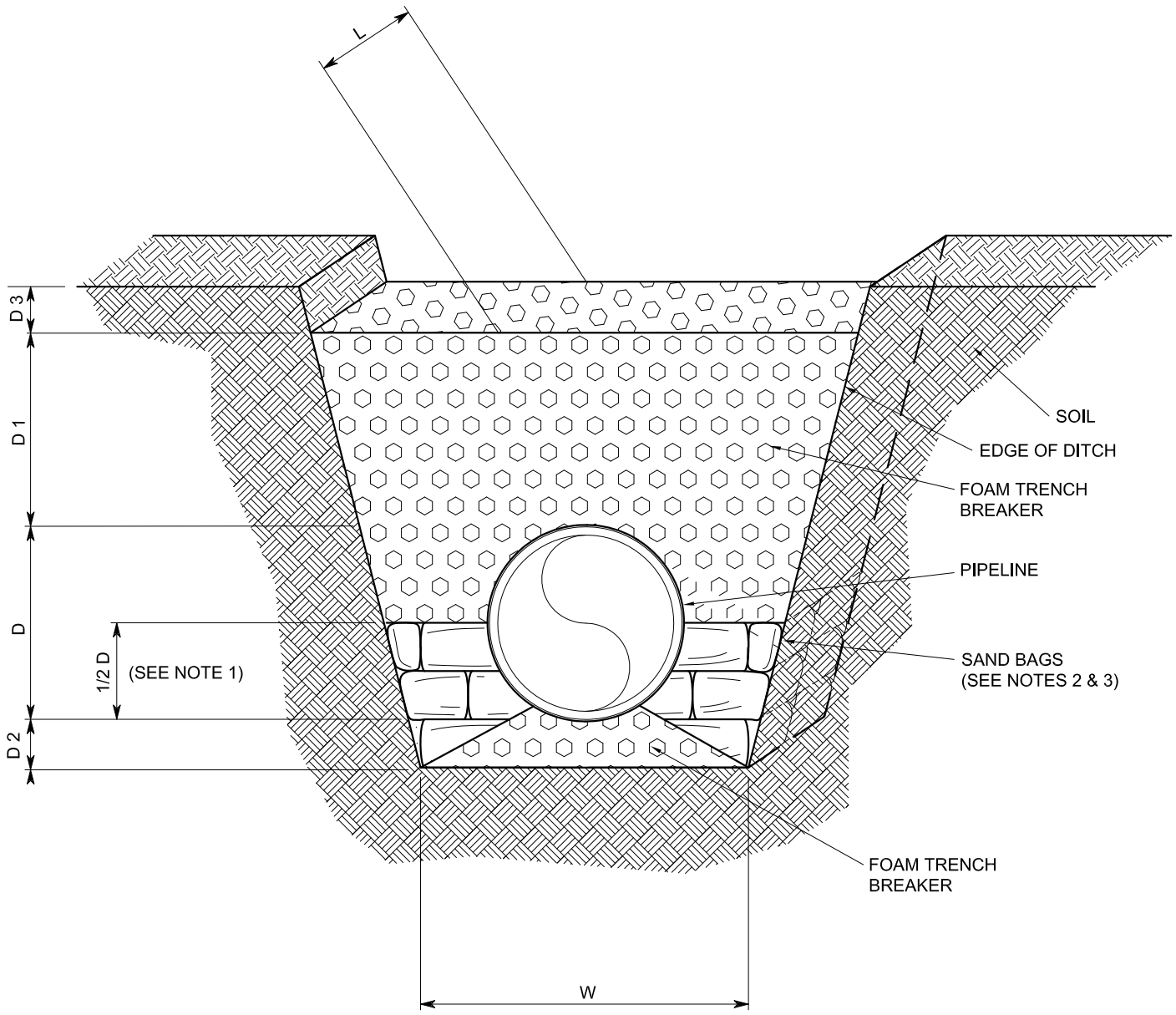
NOTE:

1. USE OF SAKRETE SHALL REQUIRE PRIOR COMPANY APPROVAL.
2. TOPSOIL SHALL NOT BE USED TO CONSTRUCT BREAKERS.
3. DO NOT INSTALL TRENCH BREAKERS WITHIN A WETLAND.

TRENCH BREAKER DETAIL (SACK)

FIGURE EC-10

DWG. ES-0020 REV.



D = PIPE DIAMETER
D1 = APPROXIMATELY 24"
D2 = APPROXIMATELY 6" (8" MIN. IN ROCK)
D3 = APPROXIMATELY 12"
W = D + 2 to 4 FEET
L = APPROXIMATELY 18" - 24"
D1 + D3 = 36" MINIMUM

NOTE:

1. A MINIMUM OF TWO LAYERS OF BAGS SHALL BE INSTALLED.
2. THE ADDITION OF SAND BAGS UNDER THE FOAM WILL BE PLACED AS PRESCRIBED IN THE E&S PLAN OR AT THE DISCRETION OF THE ENVIRONMENTAL INSPECTOR (EI).
3. FOAM TRENCH BREAKERS ARE TO BE USED WITHIN UPLAND AREAS. DO NOT USE FOAM TRENCH BREAKERS AT WATERBODY OR WETLAND BOUNDARIES..

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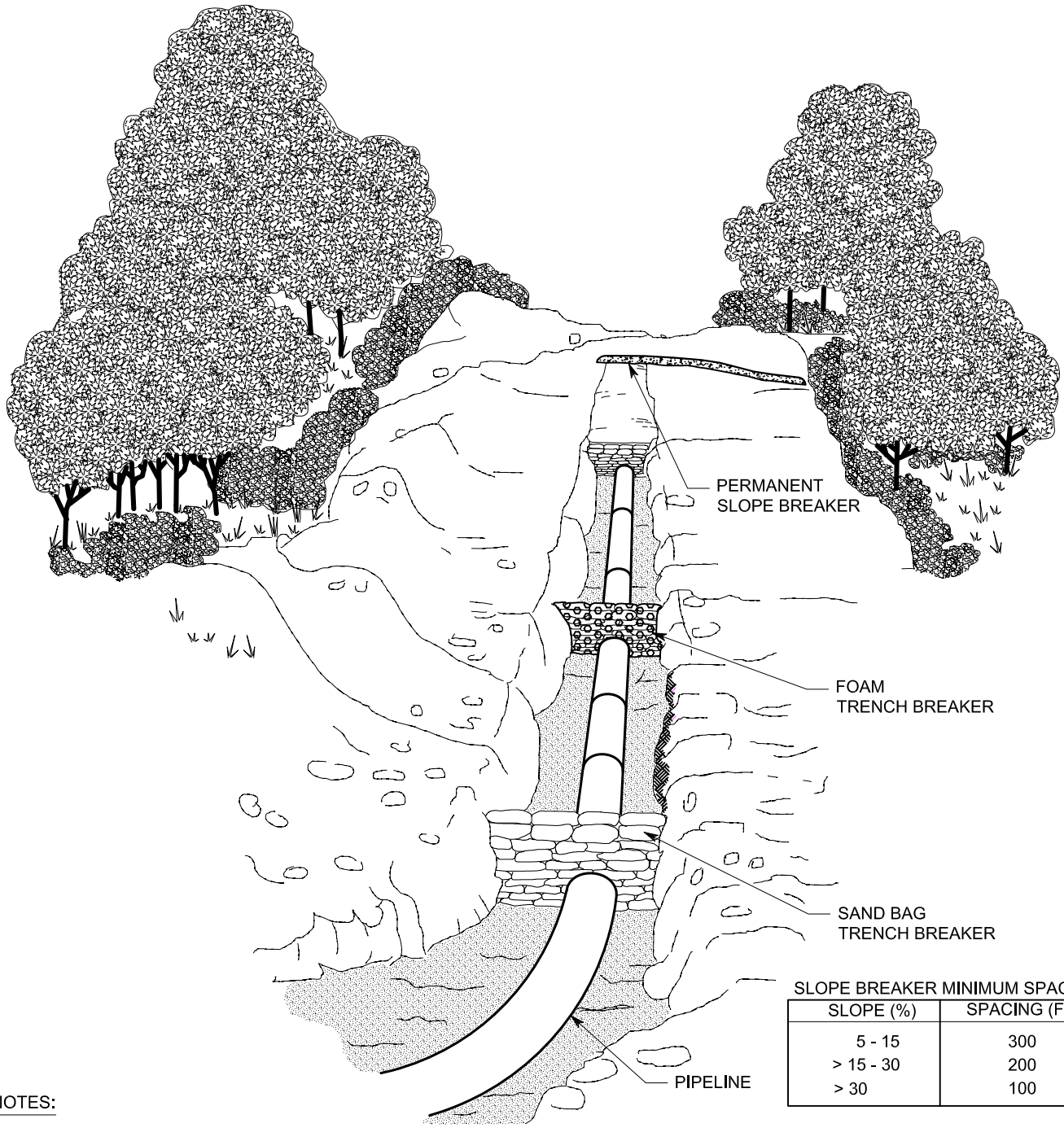
TRENCH BREAKER DETAIL (FOAM)

FIGURE EC-11

DWG. ES-0021 REV.



SLOPE BREAKER MINIMUM SPACING

SLOPE (%)	SPACING (FT)
5 - 15	300
> 15 - 30	200
> 30	100

NOTES:

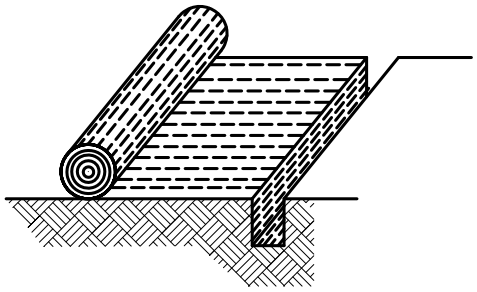
1. PERMANENT TRENCH BREAKER MATERIALS WILL CONSIST OF SAND BAGS, POLYURETHANE FOAM OR SOME FUNCTIONAL EQUIVALENT PLACED ACROSS THE DITCH AS IDENTIFIED IN PERMIT REQUIREMENTS. DO NOT USE TOPSOIL FOR TRENCH BREAKERS. THESE OPTIONS ARE DEPICTED ABOVE.
2. PERMANENT TRENCH BREAKERS, WHICH ARE USED IN CONJUNCTION WITH SLOPE BREAKERS, SHALL BE INSTALLED AT THE LOCATIONS SHOWN ON THE CONSTRUCTION DRAWINGS OR AS DETERMINED IN THE FIELD BY THE ENVIRONMENTAL INSPECTOR.
3. AT A MINIMUM, INSTALL A TRENCH BREAKER AT THE BASE OF SLOPES GREATER THAN 5 PERCENT WHERE THE BASE OF THE SLOPE IS LESS THAN 50 FEET FROM A WATERBODY OR WETLAND AND WHERE NEEDED TO AVOID DRAINING A WATERBODY OR WETLAND.
4. INSTALL TRENCH BREAKERS AT WETLAND BOUNDARIES AND/OR SEAL THE TRENCH BOTTOM AS NECESSARY TO MAINTAIN THE ORIGINAL WETLAND HYDROLOGY. DO NOT INSTALL TRENCH BREAKERS WITHIN A WETLAND.
5. IN AGRICULTURAL FIELDS AND RESIDENTIAL AREAS WHERE SLOPE BREAKERS ARE NOT TYPICALLY REQUIRED, INSTALL TRENCH BREAKERS AT THE SAME SPACING AS IF PERMANENT SLOPE BREAKERS WERE REQUIRED.

PERMANENT TRENCH BREAKER OPTIONS

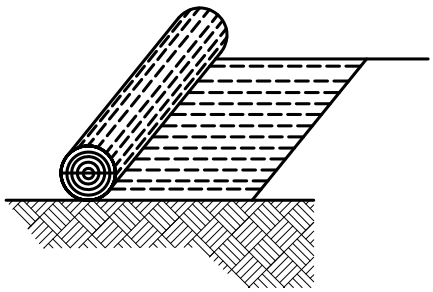
FIGURE EC-12

DWG. ES-0022 REV.

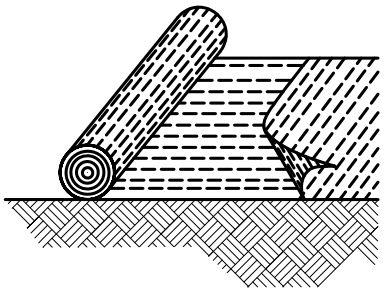
A. BURY THE TOP END OF THE ROLL IN A 6" TRENCH (TYPICAL)



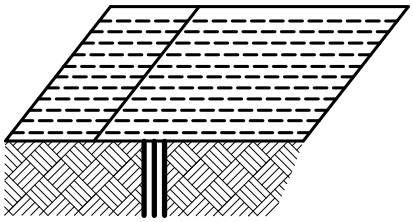
B. DOUBLE STAPLE EVERY 12" BEFORE BACKFILLING AND COMPACTING.

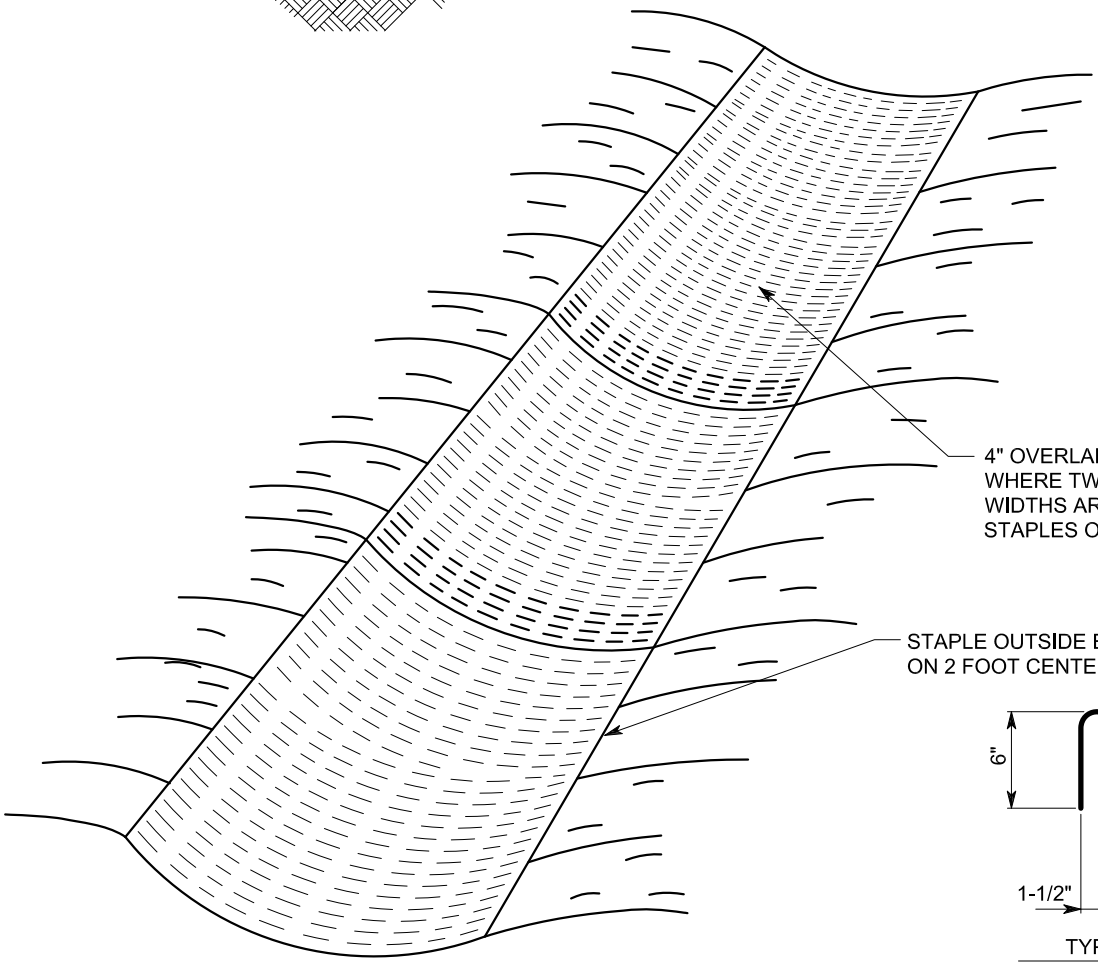


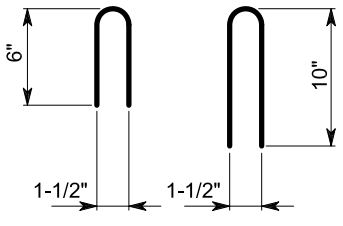
C. BURY AND TAMP UPPER END OF LOWER STRIP AS IN "A" AND "B". OVERLAP END OF TOP STRIP 4" AND STAPLE.



D. WHERE FABRIC STOPS, FOLD, BURY, AND TAMP ROLL IN SLIT TRENCH. PROVIDE DOUBLE ROW OF STAPLES







TYPICAL STAPLES
NO. 11 GAUGE WIRE

EROSION CONTROL FABRIC INSTALLATION

FIGURE EC-13

DWG. ES-0023 REV.

I.G. ES0023.DWG

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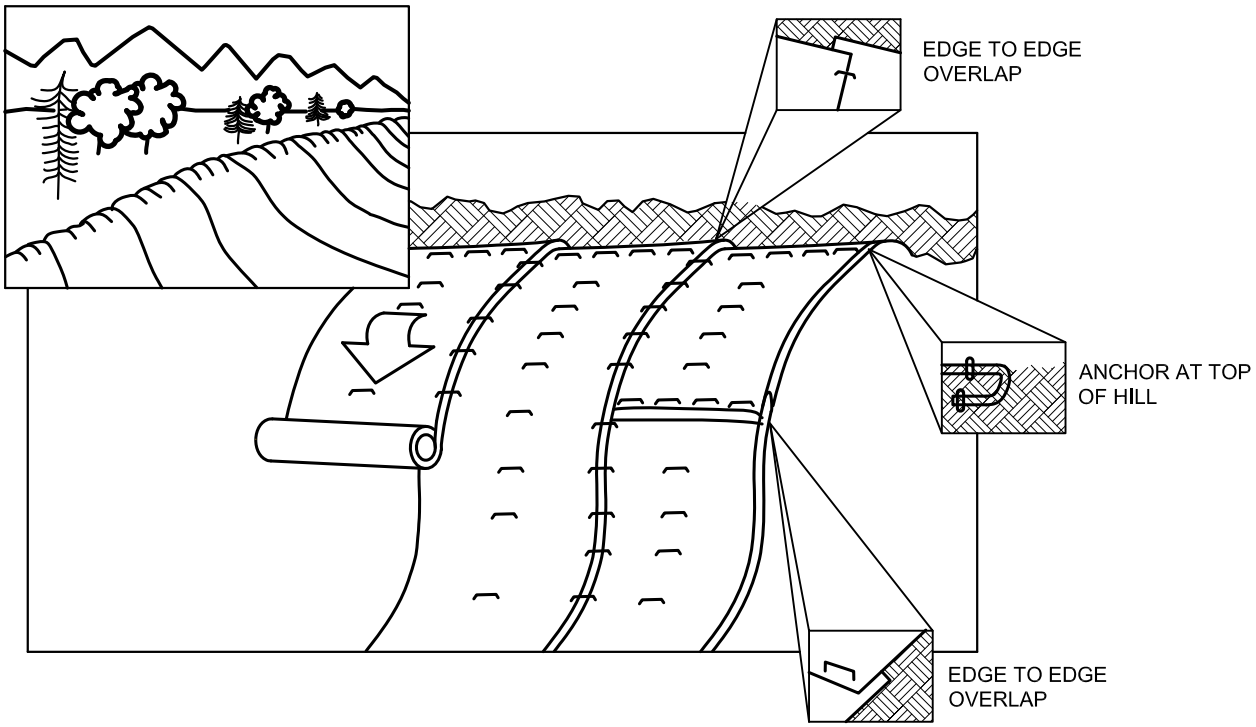
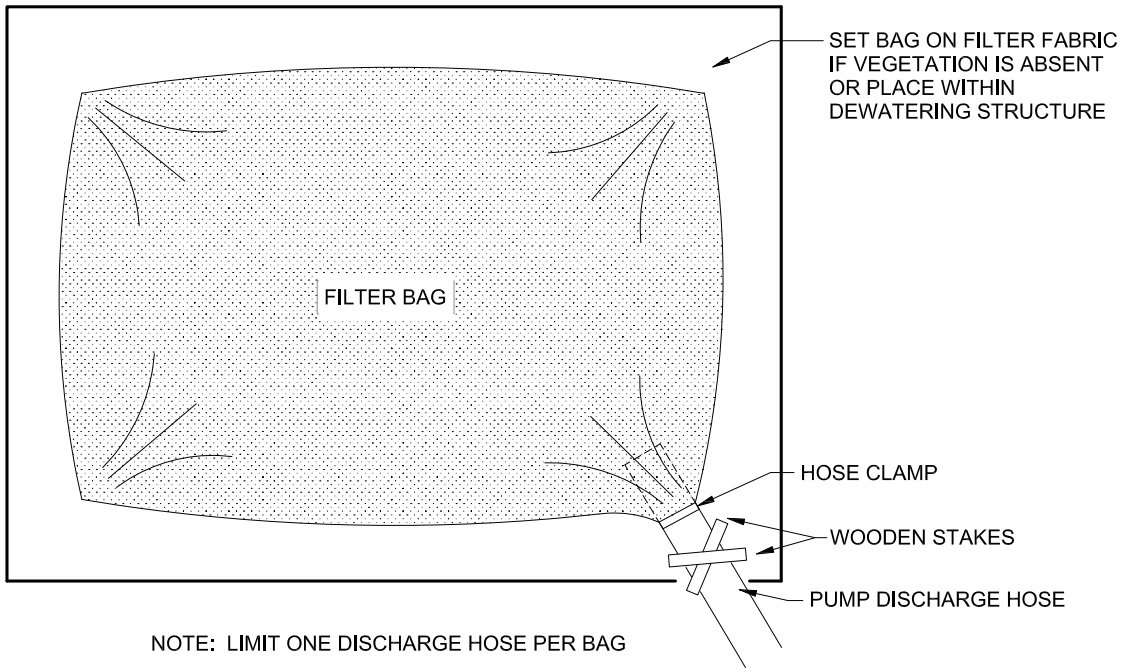


NOTES:

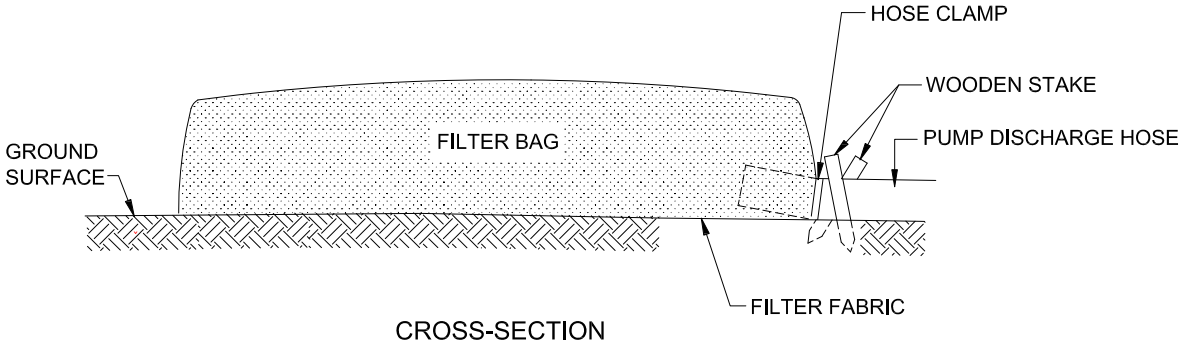
1. EROSION CONTROL BLANKETS (FABRIC) SHALL BE USED AT LOCATIONS IDENTIFIED IN THE PLAN AND/OR AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
2. EROSION CONTROL BLANKETS SHALL MEET THE REQUIREMENTS SPECIFIED IN THE PLAN AND/OR AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
3. STAPLES SHALL BE MADE OF 11 GAUGE WIRE, U-SHAPED WITH 6" LEGS AND A 1" CROWN. STAPLES SHALL BE DRIVEN INTO THE GROUND FOR THE FULL LENGTH OF THE STAPLE LEGS.
4. BLANKETS SHALL BE INSTALLED ACCORDING TO MANUFACTURER SPECIFICATIONS OR AS STATED BELOW:
   - EXTEND TOP OF BLANKET 3 FEET PAST THE UPPER EDGE OF THE SLOPE.
   - ANCHOR ("KEY") THE UPPER EDGE OF THE BLANKET INTO THE SLOPE USING A 6" DEEP TRENCH AND ROLL THE BLANKET DOWN THE HILL. DOUBLE STAPLE EVERY 12" BEFORE BACKFILLING AND COMPACTING TRENCH.
   - INSTALL LOOSELY ON SLOPE AND AVOID STRETCHING EROSION CONTROL BLANKETS DURING INSTALLATION.
   - BRING ROLL BACK OVER THE TOP OF THE TRENCH AND CONTINUE TO ROLL DOWN SLOPE. STAPLE EVERY 12" WHERE BLANKETS EXIT THE TRENCH AT THE TOP OF THE SLOPE.
   - WHEN BLANKETS ARE SPLICED DOWN-SLOPE TO ADJOINING BLANKETS (SLOPE OR STREAMBANK MATS), THE UPPER BLANKET SHALL BE PLACED OVER THE LOWER (SHINGLE STYLE) WITH APPROXIMATELY 6" OF OVERLAP. STAPLE THROUGH THE OVERLAPPED AREA EVERY 12".
   - OVERLAP ADJACENT BLANKETS 6". STAPLE EDGES OF BLANKETS AND CENTER EVERY 36".
5. IN LIVESTOCK AREAS WHERE EROSION CONTROL BLANKETS ARE APPLIED TO THE SLOPES, FENCING WILL BE USED IF NECESSARY TO EXCLUDE LIVESTOCK, WITH PERMISSION OF THE LANDOWNER.
6. MONITOR WASHOUTS, STAPLE INTEGRITY OR BLANKET MOVEMENT. REPLACE OR REPAIR AS NECESSARY.
7. DO NOT USE SYNTHETIC MONOFILAMENT MESH / NETTED MATERIALS IN AREAS DESIGNATED AS SENSITIVE WILDLIFE HABITAT, UNLESS THE PRODUCT IS SPECIFICALLY DESIGNED TO MINIMIZE HARM TO WILDLIFE.

	TYPICAL EROSION CONTROL BLANKETS ON SLOPES	FIGURE EC-14
		DWG. ES-0024 REV.



NOTE: LIMIT ONE DISCHARGE HOSE PER BAG

PLAN VIEW



CROSS-SECTION

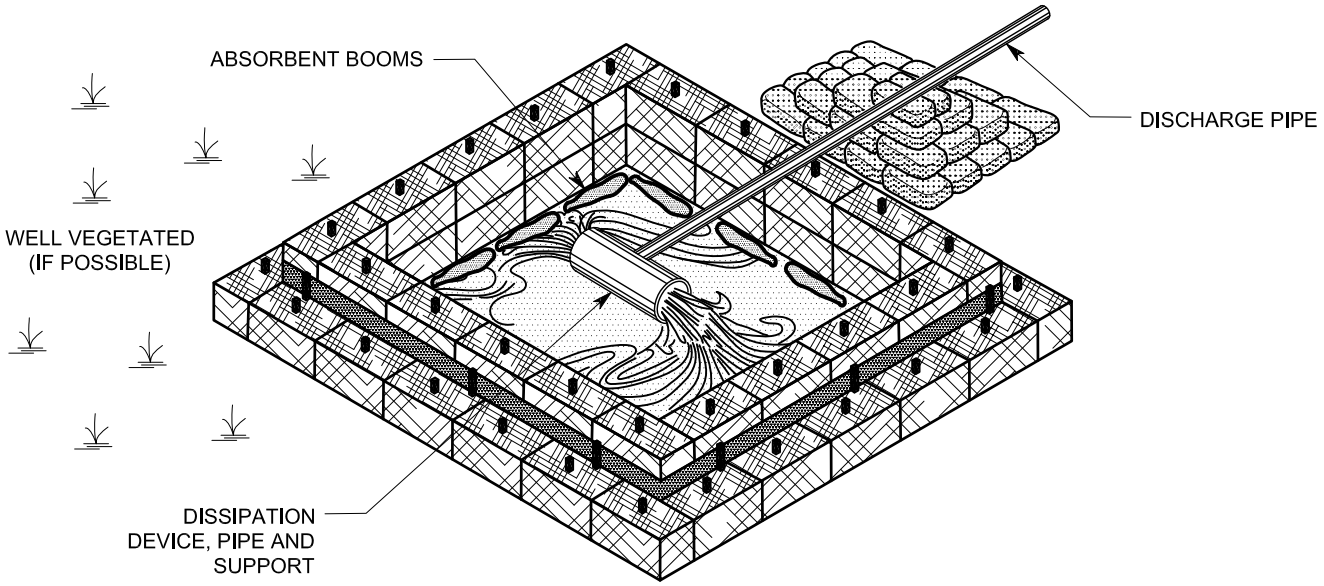
NOTES:

1. THE FILTER BAG OR STRUCTURE MUST BE MANNED WHEN THE PUMPING IS INITIATED TO ENSURE PROPER OPERATION AND FUNCTIONALITY.

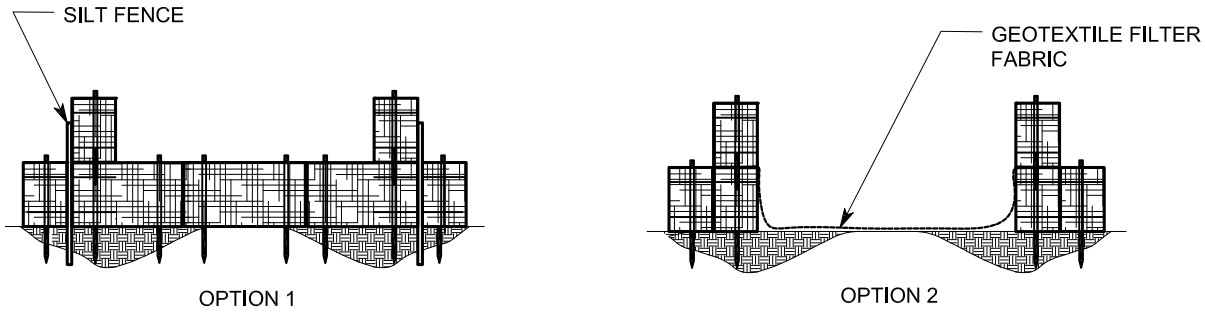
2. REMOVE DEWATERING STRUCTURE AS SOON AS PRACTICABLE AFTER COMPLETION OF DEWATERING ACTIVITIES.

3. PLACEMENT OF FILTERBAGS SHOULD BE IN A MANNER THAT BAG USE DOES NOT CAUSE EROSION. IF SITE CONDITIONS ALLOW, PLACE FILTER BAG IN WELL-VEGETATED AREA, A MINIMUM OF 50 FEET FROM WETLANDS OR WATERBODIES.

	FILTER BAG	FIGURE WD-1
		DWG. ES-0025 REV.



PLAN VIEW



CROSS SECTION VIEWS

NOTES:

1. SIZE AND DIMENSION OF DEWATERING STRUCTURE WILL VARY DEPENDING ON THE VOLUME AND RATE OF DISCHARGE. STAGGER PLACEMENT OF STRAW BALES WHEN TWO ROWS ARE USED.
2. COVER THE BASE OF THE DISCHARGE STRUCTURE EITHER WITH STRAW BALES (OPTION 1) OR LINE WITH GEOTEXTILE FABRIC (OPTION 2).
3. PROVIDE SUPPORT TO ENSURE THAT DISCHARGE PIPE DOES NOT REST ON STRAW BALES.
4. PLASTIC SHEETING, WOODEN MATS OR STEEL PLATES MAY ALSO BE USED, AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR, TO PREVENT EROSION, STREAMBED SCOUR, SUSPENSION OF SEDIMENTS OR EXCESSIVE STREAMFLOW.
5. ABSORBENT BOOMS MUST BE USED DURING DISCHARGES FROM EXISTING / USED PIPE OR AS DIRECTED BY PERMIT REQUIREMENTS.
6. PREVENT EROSION, STREAMBED SCOUR, SUSPENSION OF SEDIMENTS AND EXCESSIVE STREAMFLOW BY PROPER DESIGN OF STRUCTURE, REGULATING THE WATER DISCHARGE RATE AS WELL AS USE OF ENERGY DISSIPATION DEVICE(S) AND SEDIMENT BARRIERS, AS NECESSARY.

	DISCHARGE STRUCTURE FOR HYDROSTATIC TEST WATER	FIGURE WD-2
		DWG. ES-0026 REV.

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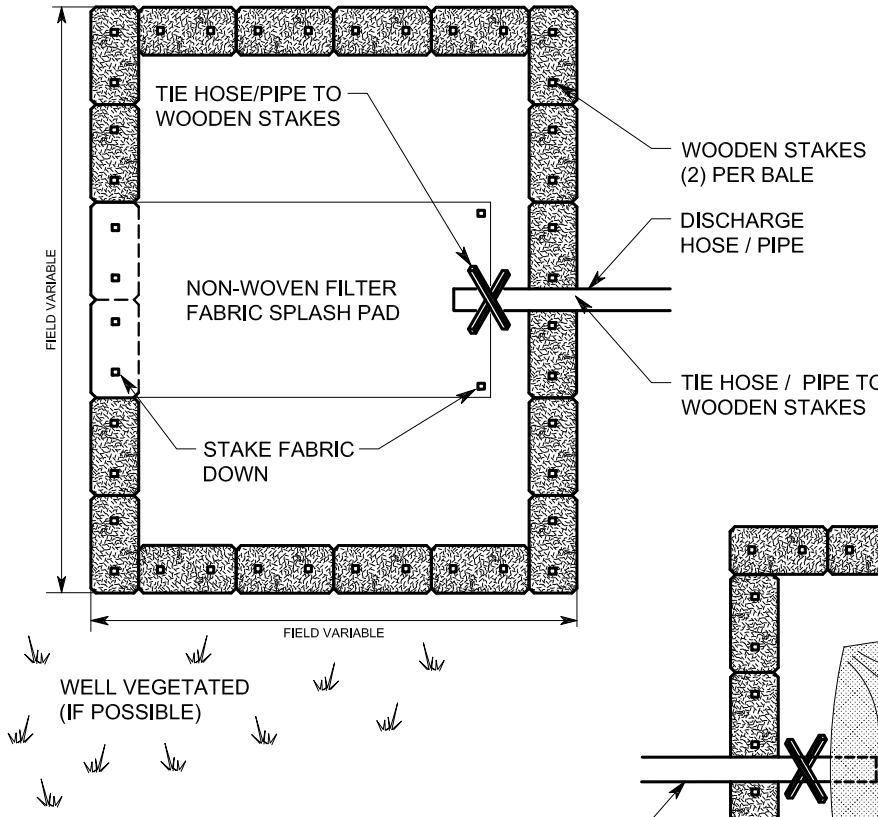
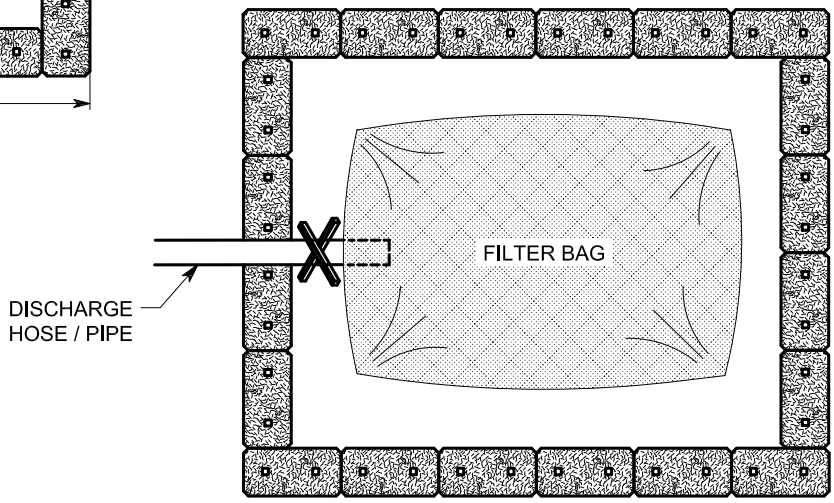
OPTION A



OPTION B



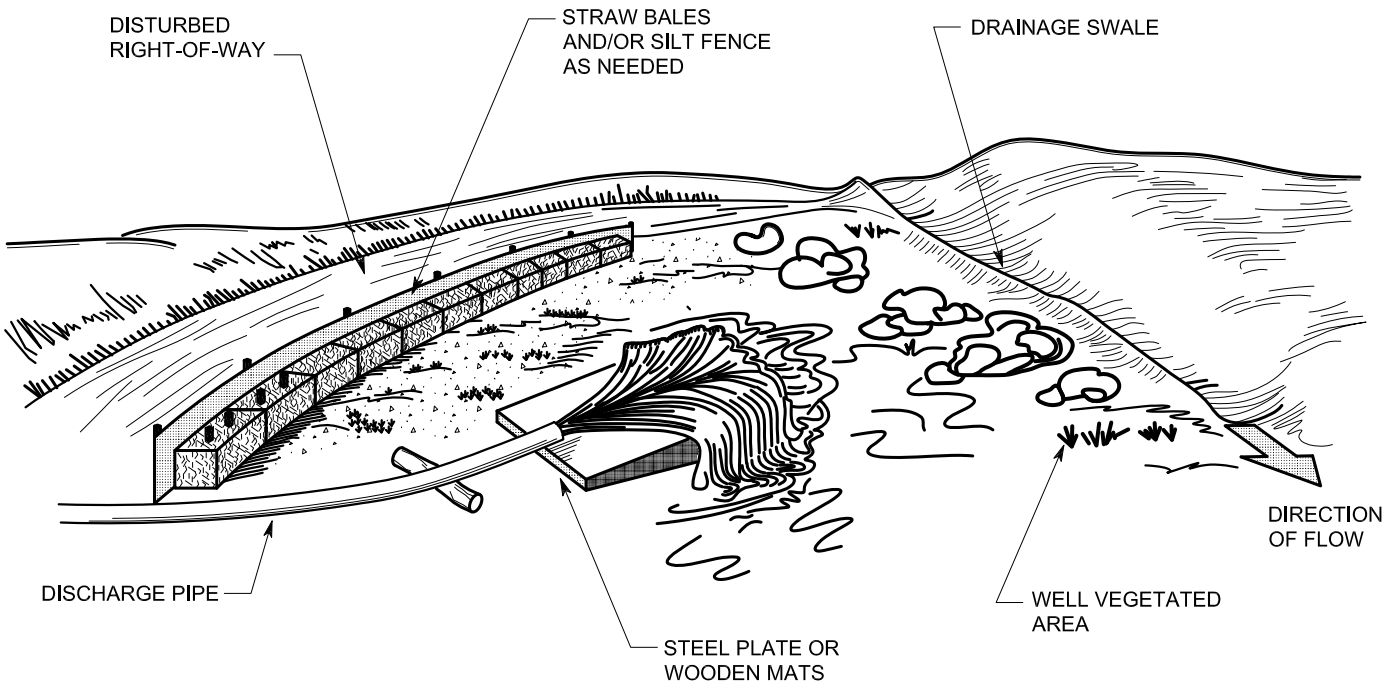
PLAN VIEW

NOT TO SCALE

NOTES:

1. SIZE AND DIMENSION OF DEWATERING STRUCTURE, INCLUDING NUMBER OF STRAW BALES USED, WILL VARY DEPENDING ON VOLUME OF WATER DISCHARGED, RATE OF DISCHARGE AND SITE CONDITIONS, SUCH AS THE TYPE AND AMOUNT OF SEDIMENT WITHIN THE DISCHARGE WATER.
2. PREVENT EROSION, STREAMBED SCOUR, SUSPENSION OF SEDIMENTS AND EXCESSIVE STREAMFLOW BY PROPER DESIGN OF STRUCTURE, REGULATING THE WATER DISCHARGE RATE AS WELL AS USE OF ENERGY DISSIPATION DEVICE(S) AND SEDIMENT BARRIERS, AS NECESSARY.
3. MONITOR AND CONDUCT DISCHARGES IN A MANNER THAT DOES NOT CAUSE EROSION AND DOES NOT RESULT IN SILT-LADEN WATER FLOWING INTO ANY WATERBODY OR WETLAND.
4. DO NOT DEPOSIT SAND, SILT, AND/OR SEDIMENT INTO SENSITIVE ENVIRONMENTAL RESOURCE AREAS, INCLUDING WETLANDS, WATERBODIES, CULTURAL RESOURCE SITES, AND SENSITIVE SPECIES HABITATS. STOP DEWATERING ACTIVITIES IF SUCH DEPOSITION IS OCCURRING AND ENSURE THE DESIGN OF THE DISCHARGE IS CHANGED TO PREVENT REOCCURRENCE.
5. ABSORBENT BOOMS MUST BE USED DURING DISCHARGES FROM EXISTING / USED PIPE OR AS DIRECTED BY PERMIT REQUIREMENTS.
6. FILTER BAGS SHOULD BE INSTALLED ACCORDING TO THE DETAILS SHOWN IN "FILTER BAG" FIGURE.
7. REMOVE STRUCTURE AS SOON AS PRACTICABLE AFTER COMPLETION OF WATER DISCHARGES.

	OPTIONS FOR SMALL WATER DISCHARGES	FIGURE WD-3
		DWG. ES-0027 REV.



NOTES:

1. USE BACKHOE BUCKET OR DOZER BLADE TO ANCHOR DISCHARGE PIPE.

2. ON FLAT TERRAIN, USE STACKED STRAW BALES AND SILT FENCE AS NEEDED TO DIVERT WATER AWAY FROM DISTURBED RIGHT-OF-WAY.

	DISCHARGE OF HYDROSTATIC TEST WATER TO A SURFACE WATER	FIGURE WD-4
		DWG. ES-0028 REV.

I.G. ES0028.DWG

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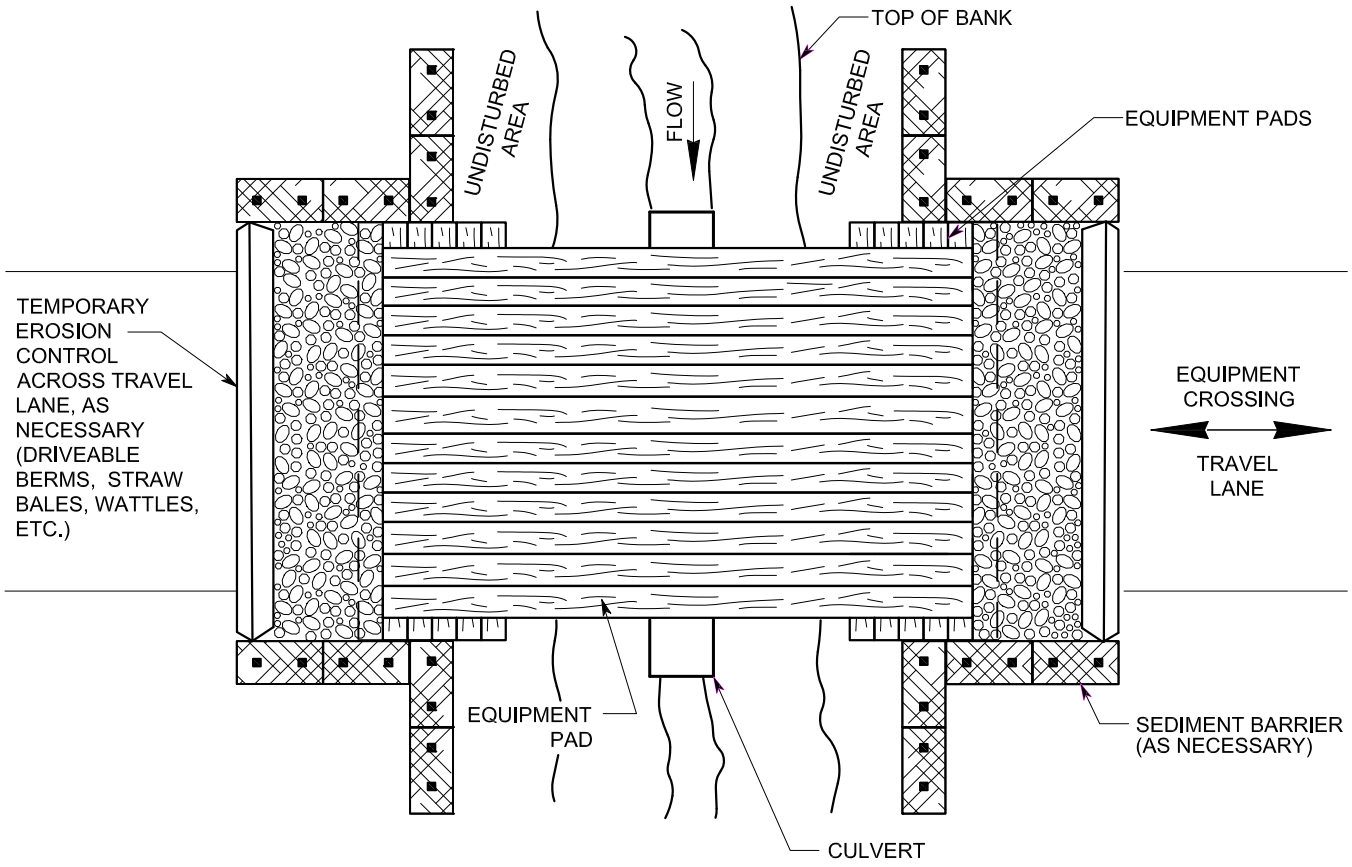
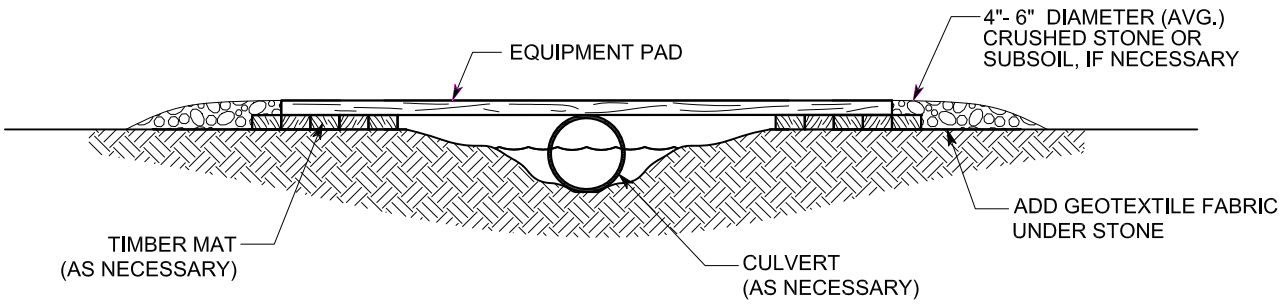


PLAN VIEW

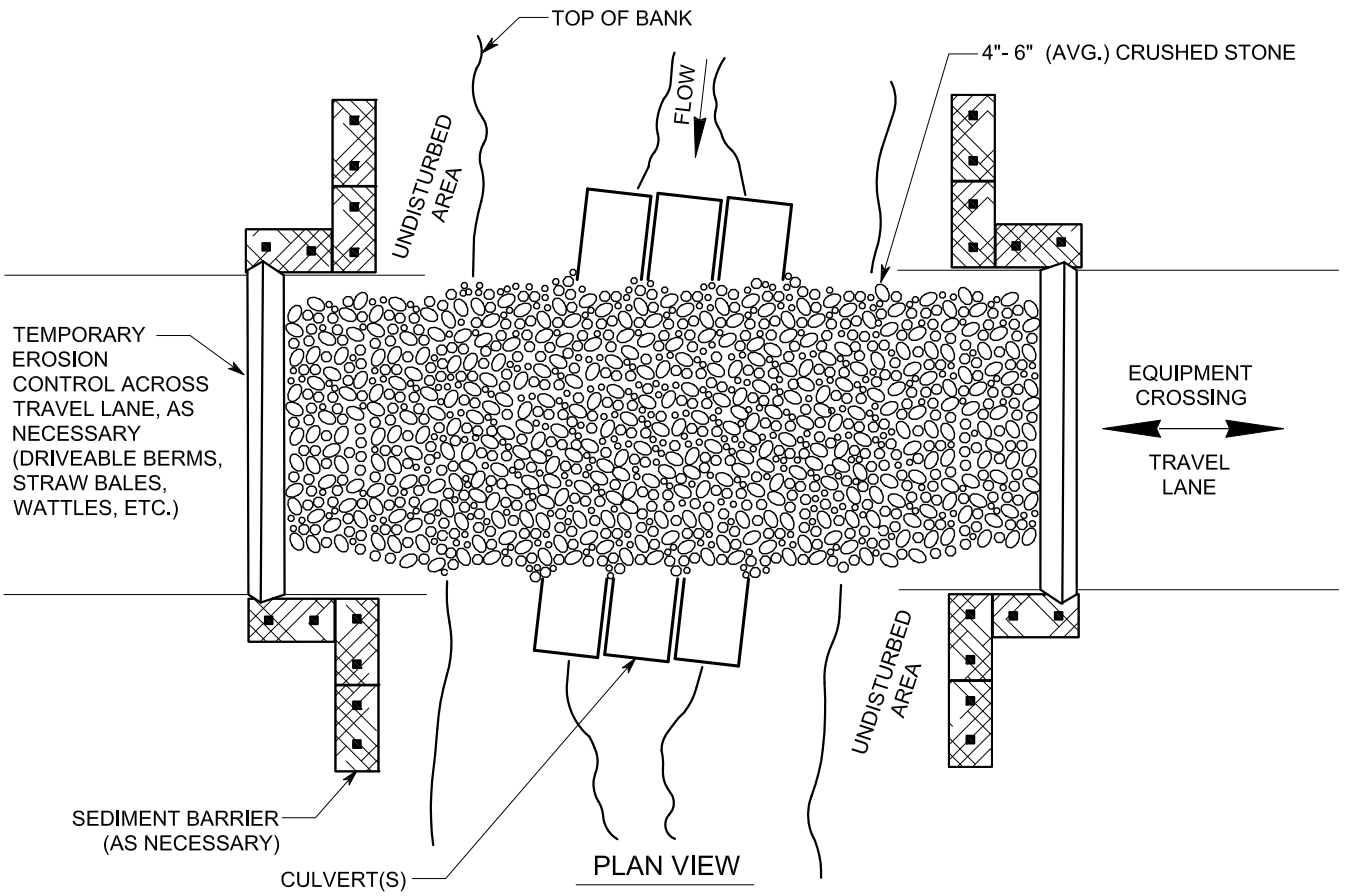


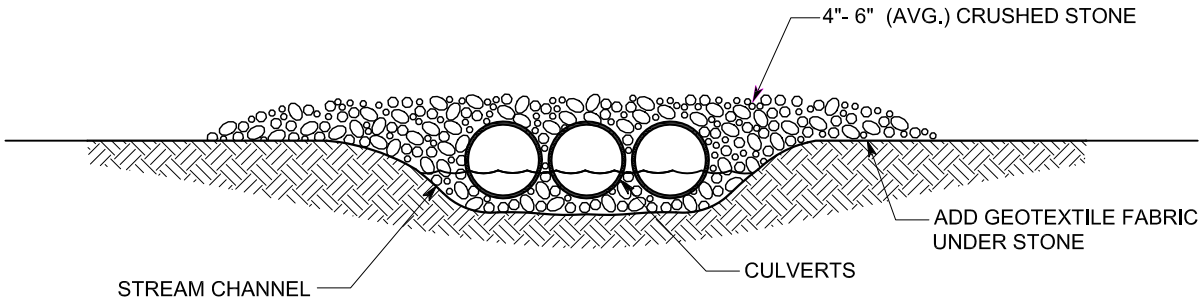
CROSS SECTION VIEW

NOTES:

1. TEMPORARY SEDIMENT BARRIER CONSISTS OF SILT FENCE AND/ OR STRAW BALES, OR OTHER APPROPRIATE MATERIAL.
2. NUMBER AND DIAMETER OF CULVERTS, AS WELL AS USE OF CULVERTS, WILL DEPEND ON SITE-SPECIFIC CONDITIONS.
3. EQUIPMENT PAD, TYPICALLY CONSTRUCTED OF HARDWOOD, SHALL BE IN GOOD CONDITION AND MUST ACCOMMODATE THE LARGEST EQUIPMENT USED. ADDITIONAL EQUIPMENT PADS CAN BE PUT SIDE BY SIDE IF EXTRA WIDTH IS REQUIRED. BRIDGE MUST SPAN FROM TOP OF BANK TO TOP OF BANK.
4. CRUSHED STONE OR SUBSOIL MAY BE USED AS ILLUSTRATED, IF NECESSARY, WITHIN TRAVEL LANE AS RAMP.
5. CONSTRUCT AND MAINTAIN BRIDGE TO WITHSTAND THE HIGHEST EXPECTED FLOW WHILE BRIDGE IS IN USE AND PREVENT SOIL FROM ENTERING WATERBODY. DO NOT USE SOIL TO CONSTRUCT OR STABILIZE BRIDGE.

	TEMPORARY EQUIPMENT BRIDGE (EQUIPMENT PADS WITH OR WITHOUT CULVERTS)	FIGURE BR-1
		DWG. ES-0029 REV.





CROSS SECTION VIEW

NOTES:

1. NUMBER AND DIAMETER OF CULVERTS WILL DEPEND ON SITE-SPECIFIC CONDITIONS. USE CULVERTS A MINIMUM OF 12-INCH DIAMETER.
2. ALIGN CULVERTS TO PREVENT EROSION AND STREAMBED SCOUR.
3. TEMPORARY SEDIMENT BARRIER CONSISTS OF SILT FENCES AND/OR STRAW BALES, OR OTHER APPROPRIATE MATERIALS.
4. ATTEMPT TO REMOVE ALL IMPORTED ROCK DURING REMOVAL OF THE BRIDGE.
5. DO NOT USE SOIL TO CONSTRUCT OR STABILIZE BRIDGES.

TEMPORARY EQUIPMENT BRIDGE (CRUSHED STONE WITH CULVERTS)

FIGURE BR-2

DWG. ES-0030 REV.

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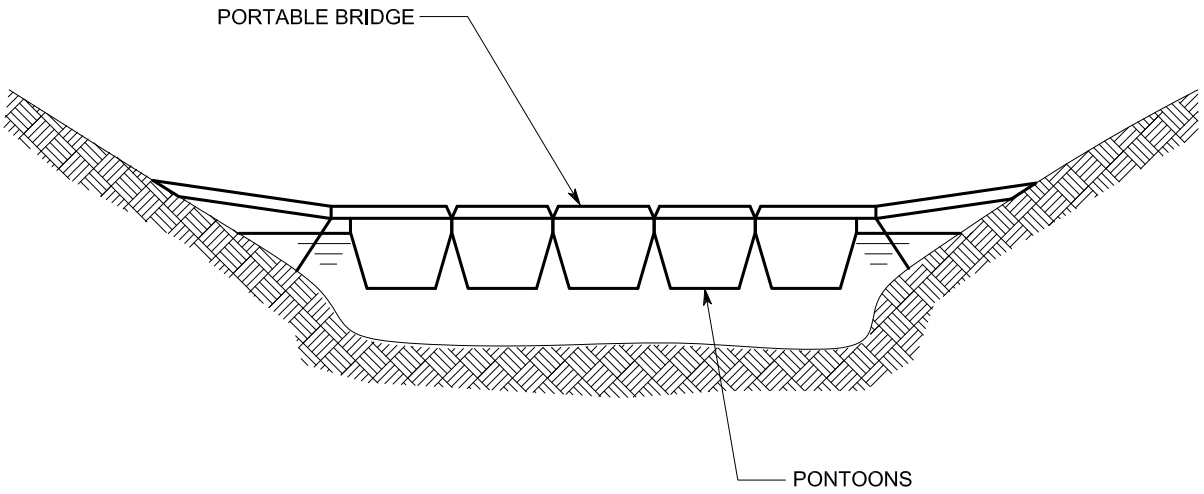
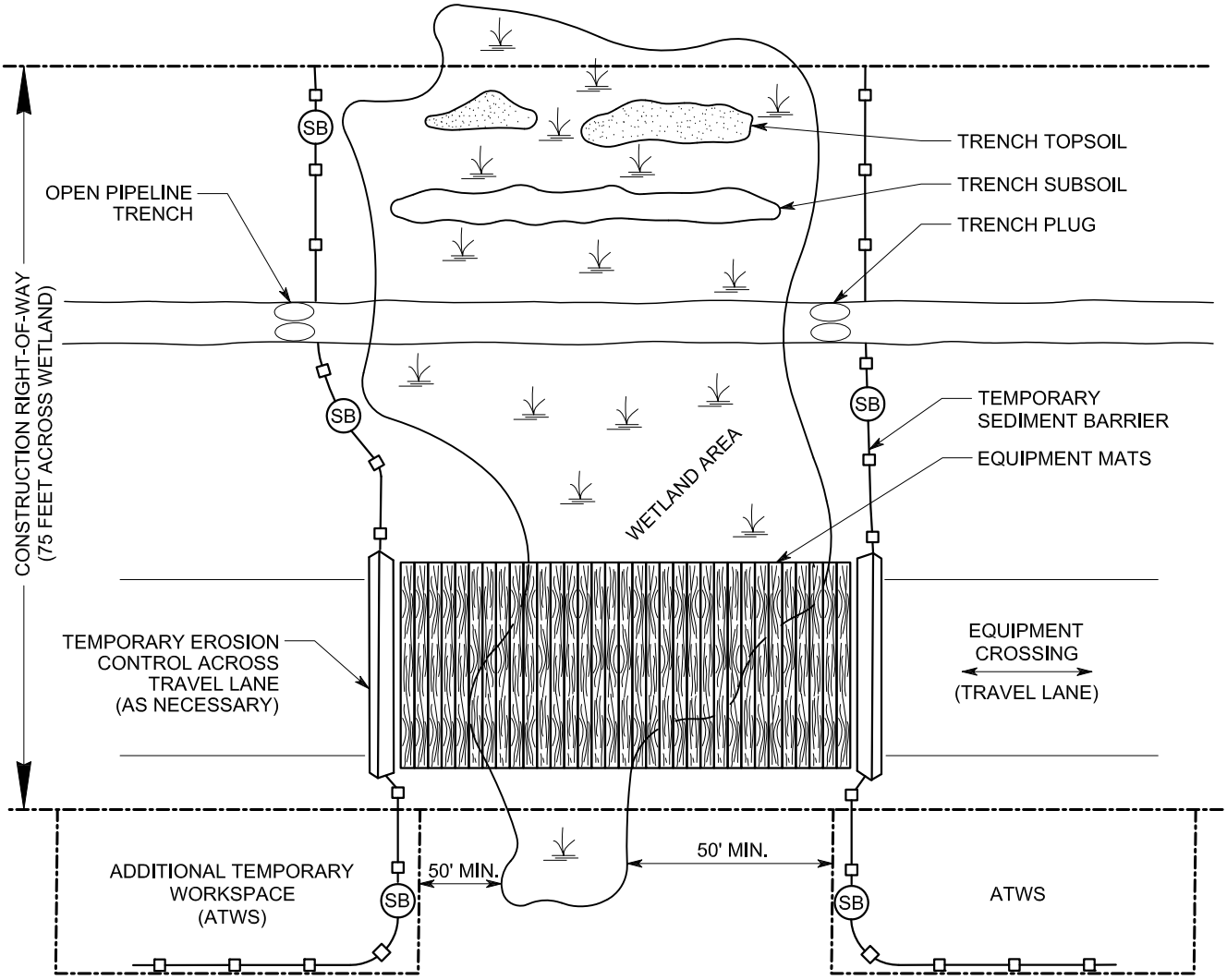


NOTES:

1. STABILIZE EDGES WITH SANDBAGS OR STONE.

2. REMOVE BRIDGE DURING CLEANUP.

	TEMPORARY EQUIPMENT BRIDGE (FLEXI-FLOAT OR PORTABLE BRIDGE)	FIGURE BR-3
		DWG. ES-0031 REV.



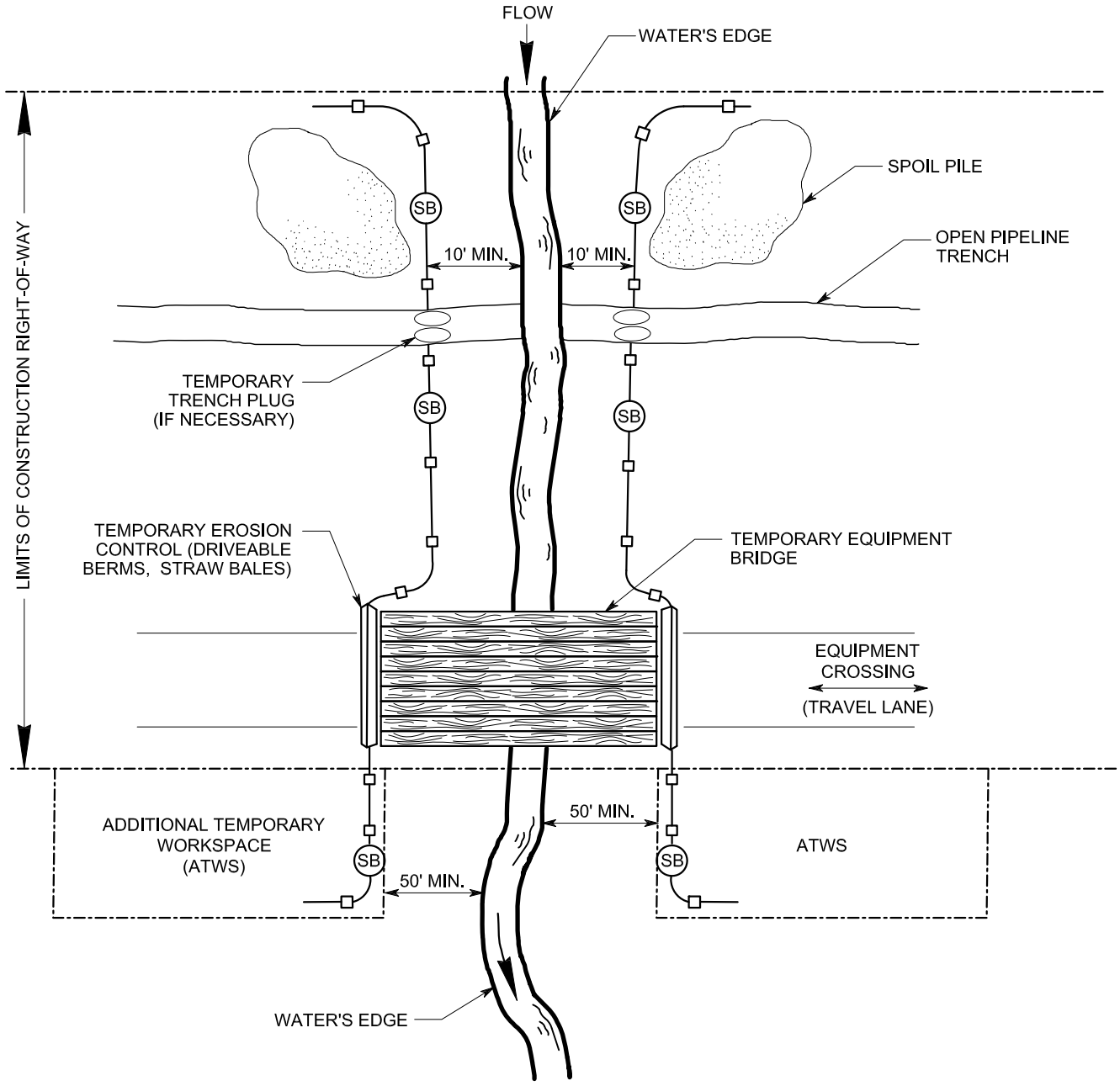
NOTES:

1. IN WETLANDS, EQUIPMENT MATS OR LOW GROUND WEIGHT EQUIPMENT SHALL BE UTILIZED IN SATURATED GROUND CONDITIONS.
2. LIMIT PULLING OF TREE STUMPS AND GRADING TO DIRECTLY OVER TRENCHLINE, EXCEPT IN SITUATIONS THAT THE CHIEF INSPECTOR AND ENVIRONMENTAL INSPECTOR DETERMINE SAFETY-RELATED CONSTRUCTION CONSTRAINTS REQUIRE GRADING OR THE REMOVAL OF STUMPS FROM UNDER THE WORKING SIDE.
3. SEGREGATE THE TOP 12 INCHES OF TOPSOIL WITHIN THE DITCHLINE IN WETLANDS, EXCEPT IN AREAS WHERE STANDING WATER IS PRESENT OR SOILS ARE SATURATED.
4. DO NOT TRENCH THE WETLAND UNTIL THE PIPELINE IS ASSEMBLED AND READY FOR LOWERING IN.
5. CONCRETE COATING OR PIPELINE WEIGHTS OF AN APPROPRIATE TYPE, WEIGHT AND SPACING WILL BE USED AS REQUIRED. NO CONCRETE COATING ACTIVITIES WITHIN 100 FEET OF A WETLAND OR WATERBODY BOUNDARY, UNLESS THE LOCATION IS AN EXISTING INDUSTRIAL SITE DESIGNATED FOR SUCH USE.
6. INSTALL SEDIMENT BARRIERS (SB) ALONG THE EDGE OF THE CONSTRUCTION RIGHT-OF-WAY AS NECESSARY TO CONTAIN SPOIL AND SEDIMENT WITHIN THE CONSTRUCTION RIGHT-OF-WAY THROUGH WETLANDS.
7. IN THE TRAVEL LANE, SEDIMENT BARRIERS MAY CONSIST OF REMOVABLE SEDIMENT BARRIERS OR DRIVABLE BERMS.
8. AT THE BASE OF SLOPES (GREATER THAN 5 PERCENT) THAT ARE LESS THAN 50 FEET FROM A WETLAND, INSTALL AND MAINTAIN TEMPORARY SEDIMENT BARRIERS ACROSS THE ENTIRE CONSTRUCTION RIGHT-OF-WAY UNTIL REVEGETATION IS SUCCESSFUL.
9. NO FERTILIZER OR LIME SHALL BE USED WITHIN WETLANDS.
10. DEWATER THE TRENCH IN A MANNER THAT DOES NOT CAUSE EROSION OR RESULT IN SILT-LADEN WATER FLOWING INTO ANY WETLAND.

TYPICAL STANDARD WETLAND CROSSING

FIGURE WC-1

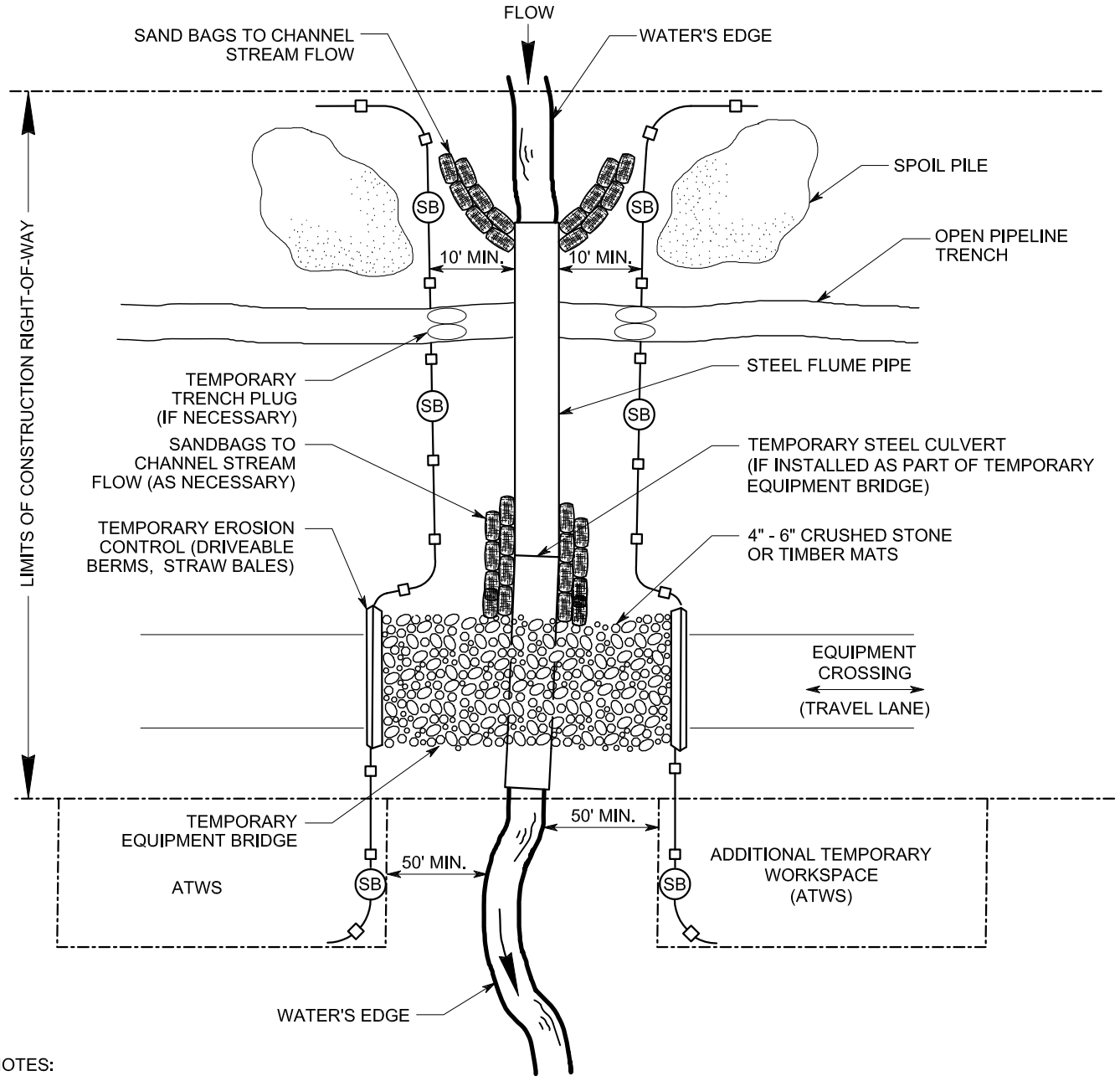
DWG. ES-0032 REV.



NOTES:

1. (SB) TEMPORARY SEDIMENT BARRIER OF SILT FENCE AND/OR STRAW BALES, OR APPROPRIATE MATERIALS.
2. FOR MINOR WATERBODIES, COMPLETE TRENCHING AND BACKFILLING IN THE WATERBODY (NOT INCLUDING BLASTING OR OTHER ROCK BREAKING MEASURES) WITHIN 24 CONTINUOUS HOURS. IF A FLUME IS INSTALLED WITHIN THE WATERBODY DURING MAINLINE ACTIVITIES, IT CAN BE REMOVED JUST PRIOR TO LOWERING IN THE PIPELINE. THE 24-HOUR TIMEFRAME STARTS AS SOON AS THE FLUME IS REMOVED.
3. FOR INTERMEDIATE WATERBODIES (>10 FEET TO 100 FEET WIDE MEASURED WATER'S EDGE TO EDGE), COMPLETE TRENCHING AND BACKFILLING IN THE WATERBODY (NOT INCLUDING BLASTING OR OTHER ROCK BREAKING MEASURES) WITHIN 48 CONTINUOUS HOURS, UNLESS SITE-SPECIFIC CONDITIONS MAKE COMPLETION WITHIN 48 HOURS INFEASIBLE.

	TYPICAL WET WATERBODY CROSSING	FIGURE WC-2
		DWG. ES-0033 REV.



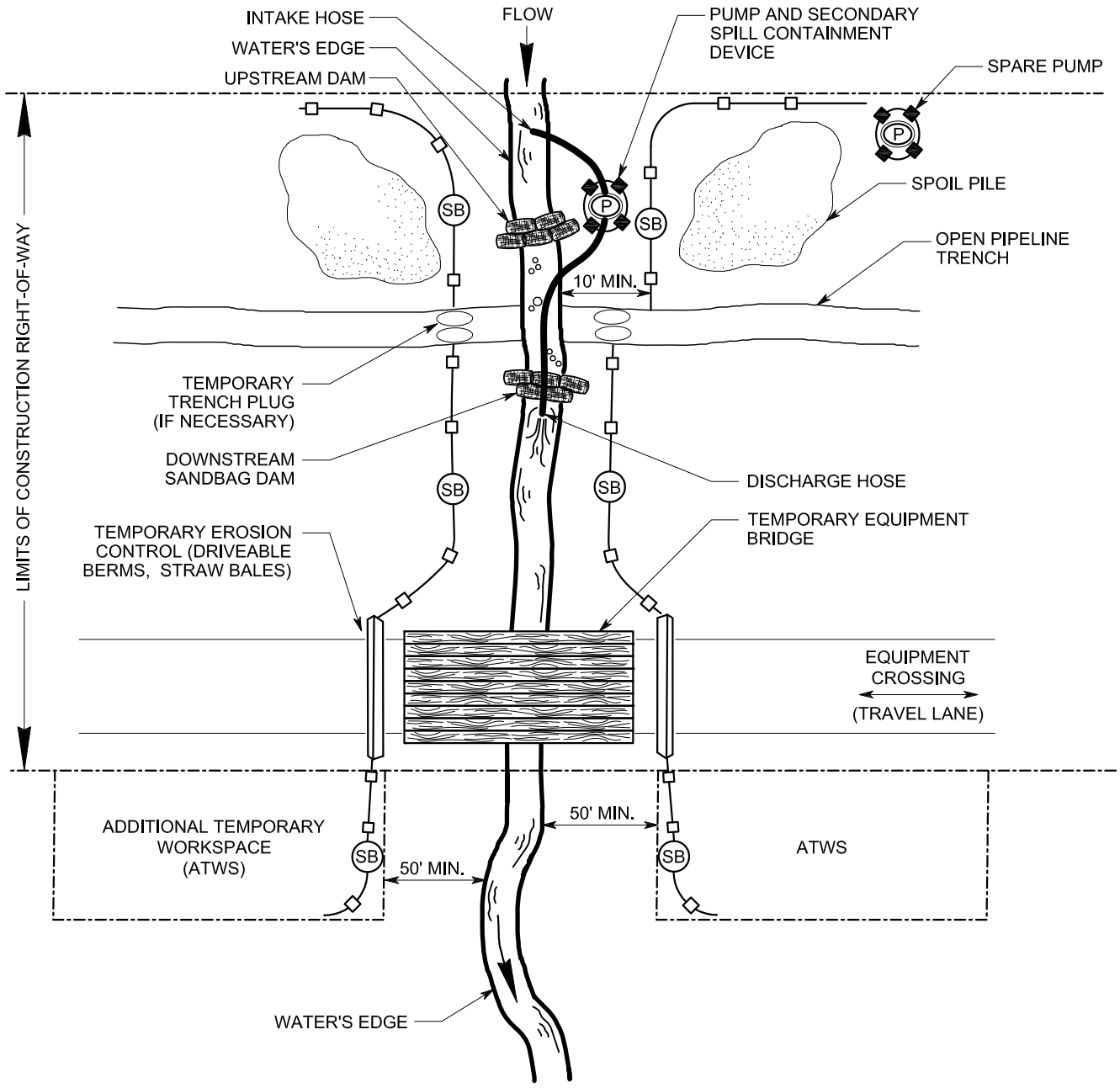
NOTES:

1. (SB) TEMPORARY SEDIMENT BARRIER OF SILT FENCE AND/ OR STRAW BALES, OR OTHER APPROPRIATE MATERIALS.
2. SAND BAGS MUST BE FILLED WITH SAND FREE OF SILT, ORGANICS, AND OTHER MATERIAL.
3. ENSURE SANDBAGS ARE INSTALLED BEFORE PLACING FLUME PIPE.
4. ALIGN FLUME(S) TO PREVENT BANK EROSION AND STREAM SCOUR.
5. CONDUCT ALL IN-STREAM ACTIVITY (EXCEPT BLASTING OR OTHER ROCK BREAKING MEASURES) WITH THE FLUME(S) IN PLACE. FLUME PIPE(S) MAY NOT BE REMOVED FOR LOWERING IN PIPE OR INITIAL STREAMBED RESTORATION EFFORTS.
6. THE ENDS OF THE FLUME AND CULVERT MUST EXTEND TO AN UNDISTURBED AREA.
7. CONTRACTOR TO DETERMINE ACTUAL NUMBER AND SIZE OF FLUMES AND CULVERTS REQUIRED BASED ON STREAM WIDTH AND STREAM FLOW RATE AT THE TIME OF CROSSING.
8. WATER ACCUMULATING WITHIN THE WORK AREA SHALL BE PUMPED TO A FILTER BAG OR DEWATERING STRUCTURE PRIOR TO DISCHARGING INTO ANY SURFACE WATER.

TYPICAL FLUME WATERBODY CROSSING

FIGURE WC-3

DWG. ES-0034 REV.



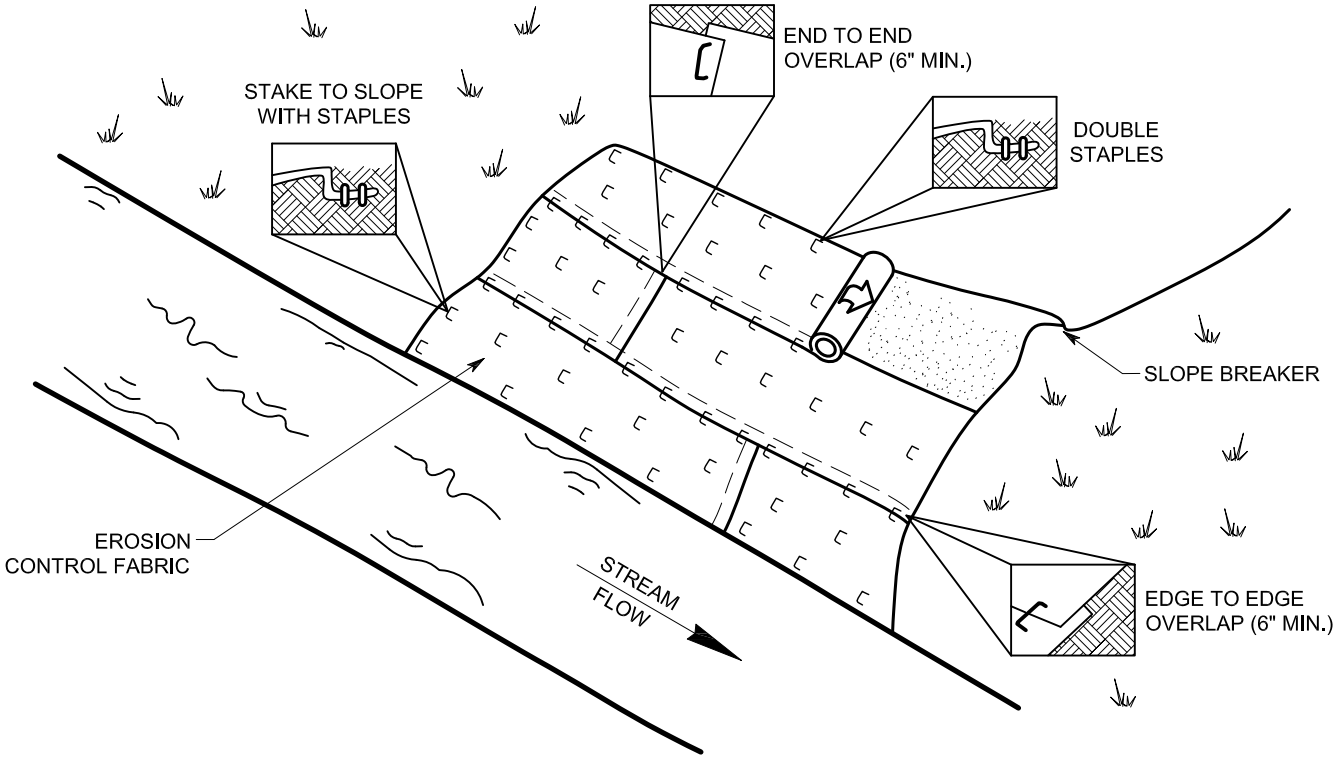
NOTES:

1. (SB) TEMPORARY SEDIMENT BARRIER OF SILT FENCE AND/ OR STRAW BALES, OR OTHER APPROPRIATE MATERIALS
2. INSTALL AND SEAL SANDBAGS UPSTREAM AND DOWNSTREAM OF THE CROSSING.
3. CREATE AN UPSTREAM SUMP USING SANDBAGS IF NATURAL SUMP IS UNAVAILABLE FOR THE INTAKE HOSE.
4. EXCAVATE ACROSS STREAM CHANNEL FOLLOWING WATER REROUTING.
5. DO NOT REFUEL OR STORE FUEL WITHIN 100 FEET OF THE WATERBODY. IF NOT FEASIBLE, ALTERNATIVE METHODS MUST BE APPROVED BY ENVIRONMENTAL INSPECTOR.
6. MONITOR PUMPS AT ALL TIMES DURING STREAM CROSSING PROCEDURE.
7. (P) USE SUFFICIENT PUMPS, INCLUDING ONSITE BACKUP PUMPS, TO MAINTAIN DOWNSTREAM FLOW.
8. SCREEN PUMP INTAKES. PREVENT SCOURING WITHIN WATERBODY BY HOSE DISCHARGE.

TYPICAL DAM-AND-PUMP WATERBODY CROSSING

FIGURE WC-4

DWG. ES-0035 REV.



NOTES:

1. EROSION CONTROL BLANKETS (FABRIC) SHALL BE PLACED ON THE BANKS OF FLOWING STREAMS WHERE VEGETATION HAS BEEN REMOVED OR AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.

2. EROSION CONTROL BLANKETS SHALL MEET THE REQUIREMENTS SPECIFIED IN THE E&S PLAN AND/OR AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.

3. STAPLES SHALL BE MADE OF 11 GAUGE WIRE, U-SHAPED WITH 6" LEGS AND A 1" CROWN. STAPLES SHALL BE DRIVEN INTO THE GROUND FOR THE FULL LENGTH OF THE STAPLE LEGS. ALTERNATELY 1" WOODEN PEGS 6" LONG AND BEVELED TO SECURE MATTING.

4. BLANKETS SHALL BE INSTALLED ACCORDING TO MANUFACTURER SPECIFICATIONS OR AS STATED BELOW:

   - EXTEND TOP OF BLANKET 2 FEET PAST THE UPPER EDGE OF THE HIGH WATER MARK. IF A SLOPE BREAKER IS PRESENT ON THE APPROACH SLOPE, BEGIN THE BLANKET ON THE UPHILL SIDE OF THE SLOPE BREAKER.
   - INSTALL BLANKET(S) ACROSS THE SLOPE IN THE DIRECTION OF THE WATER FLOW.
   - ANCHOR ("KEY") THE UPSTREAM EDGE OF THE BLANKET(S) INTO THE SLOPE USING A 6" DEEP TRENCH. DOUBLE STAPLE EVERY 12" BEFORE BACKFILLING AND COMPACTING TRENCH
   - OVERLAP THE EDGES OF PARALLEL BLANKETS A MINIMUM OF 6". PLACE THE UPPER BLANKET OVER THE LOWER BLANKET (SHINGLE STYLE) AND STAPLE EVERY 12" ALONG THE LENGTH OF THE EDGE.
   - WHEN BLANKET ENDS ARE ADJOINED, PLACE THE UPSTREAM BLANKET OVER THE DOWNSTREAM BLANKET (SHINGLE STYLE) WITH APPROXIMATELY 6" OF OVERLAP AND STAPLE THROUGH THE OVERLAPPED AREA EVERY 12".
   - STAPLE DOWN THE CENTER OF THE BLANKET(S), THREE STAPLES IN EVERY SQUARE YARD.

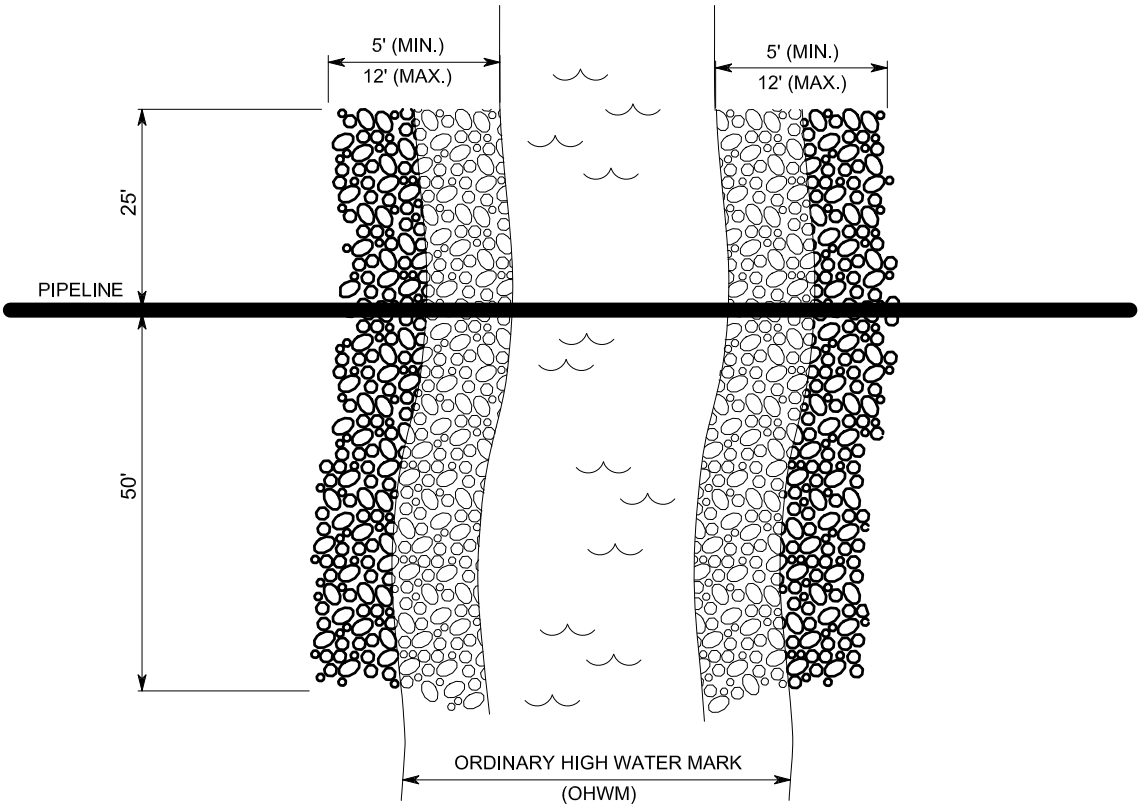
5. IN LIVESTOCK AREAS WHERE EROSION CONTROL BLANKETS ARE APPLIED TO THE STREAMBANKS, FENCING MAY BE USED IF NECESSARY TO EXCLUDE LIVESTOCK, WITH PERMISSION OF THE LANDOWNER.

6. MONITOR WASHOUTS, STAPLE INTEGRITY OR BLANKET MOVEMENT. REPLACE OR REPAIR AS NECESSARY.

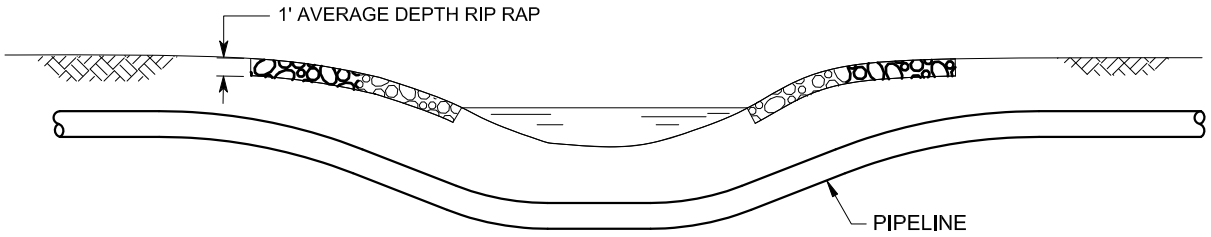
7. DO NOT USE SYNTHETIC MONOFILAMENT MESH / NETTED MATERIALS IN AREAS DESIGNATED AS SENSITIVE WILDLIFE HABITAT, UNLESS THE PRODUCT IS SPECIFICALLY DESIGNED TO MINIMIZE HARM TO WILDLIFE.

NOT TO SCALE

	TYPICAL EROSION CONTROL BLANKETS ON STREAMBANKS	FIGURE WC-5
		DWG. ES-0036 REV.



PLAN VIEW



CROSS-SECTION VIEW

NOTES:

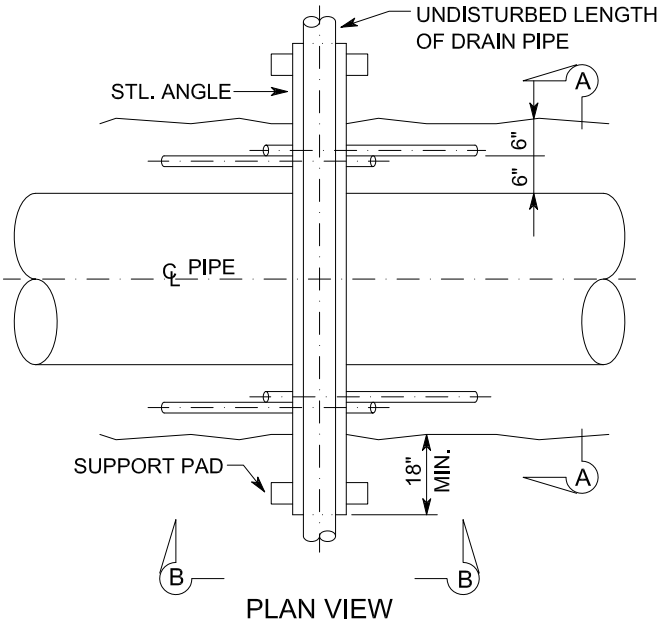
1. RIP-RAP SHALL NOT EXCEED 500 FEET IN LENGTH ALONG THE BANK.
2. RIP-RAP WILL NOT EXCEED AN AVERAGE OF ONE CUBIC YARD PER RUNNING FOOT BELOW THE OHWM.
3. RIP-RAP INSTALLATION SHALL BE IN COMPLIANCE WITH ALL APPLICABLE PERMITS.
4. RIP-RAP MUST BE CLEAN AND FREE OF SOIL AND DEBRIS.
5. RIP-RAP SHALL NOT BE PLACED IN A MANNER THAT IMPAIRS SURFACE WATER FLOW.
6. GEOTEXTILE FABRIC MAY BE INSTALLED BELOW RIP-RAP.

NOT TO SCALE

TYPICAL RIP-RAP PLACEMENT

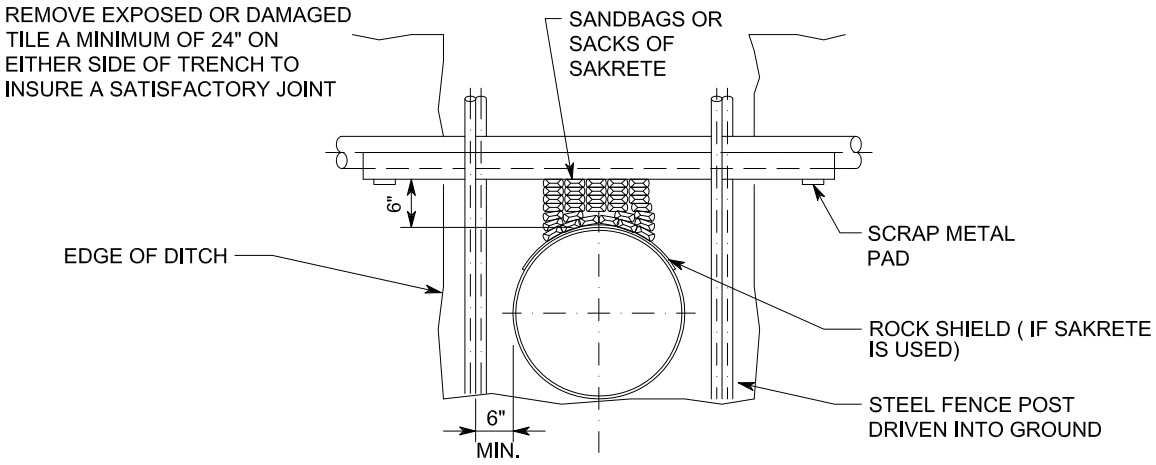
FIGURE WC-6

DWG. ES-0037 REV.



PLAN VIEW

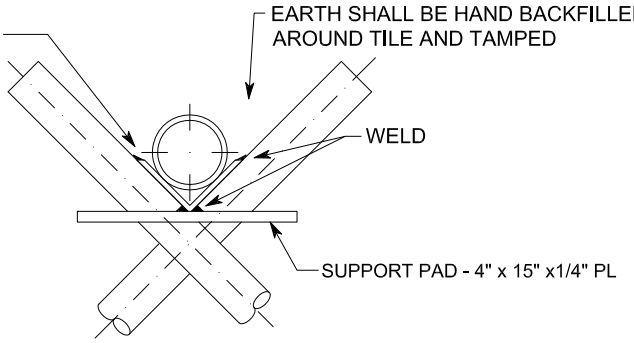
N.T.S.



SECTION "A-A"

N.T.S.

TO SUPPORT 4" & 6" TILE USE 4" x 1 / 4" ANGLE
" 8" " 6" x 7/ 16" "
" 10" " 6" x 7/ 16" "
" 12" " 8" x 1 / 2" "
" 16" " 8" x 1 / 2" "



SECTION "B-B"

N.T.S.

NOTE:
USE OF SAKRETE SHALL REQUIRE PRIOR
COMPANY APPROVAL.

DRAIN TILE REPAIR PROCEDURE

FIGURE SU-1

DWG. ES-0038 REV.

I.G. ES0038.DWG

Wayne Sicora
5/29/2014 6:08 PM

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Spill Prevention Control and Countermeasure (SPCC) Plan &

Preparedness, Prevention, and Contingency (PPC) Plan for Construction Projects

Project: **Sakonnet River HDD Replacement Project**

Location: Portsmouth and Little Compton, Rhode Island

Revised October 2017

ENBRIDGE

Environmental Construction Permitting
5400 Westheimer Court
Houston, Texas 77056-5310

TABLE OF CONTENTS

LIST OF APPENDICES

ABBREVIATIONS AND DEFINITIONS

CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CI	Chief Inspector (Company employee or Contractor Employee performing the duties of the onsite Construction Manager or Engineer)
Company	Enbridge, Inc.
Company SC	Company Spill Coordinator (The Environmental Inspector or the Chief Inspector)
Contractor	Third party service provider performing construction activities for the Company on property owned or under the control of the Company. This role may be filled by the Company on small projects constructed by Company personnel and equipment.
Contractor SC	Contractor Spill Coordinator
CWA	Clean Water Act
DOT	U. S. Department of Transportation
E&C	Engineering & Construction
ECP	Environmental Construction Permitting
EHS, EH&S	Environmental Health and Safety
EI	Environmental Inspector (Company employee or Contractor Employee performing the duties of onsite environmental specialist overseeing Contractor compliance with environmental permit conditions, laws and regulations)
E&SCP	Erosion & Sedimentation Control Plan
FERC	Federal Energy Regulatory Commission
FWPC	Federal Water Pollution Control Act
HDD	Horizontal Directional Drill
JSA	Job Safety Analysis
MSDS	Material Safety Data Sheets
ppm	Parts per Million
Environmental Lead	Environmental Construction Permitting Specialist assigned to the project
OPA	Oil Pollution Act
RCRA	Resource Conservation and Recovery Act
SPCC Plan or Plan	Spill Prevention, Control and Countermeasure Plan
TSCA	Toxic Substances Control Act

1.0 PURPOSE/PLAN OBJECTIVE

Enbridge, Inc. ("Company") has prepared this Spill Prevention, Control and Countermeasure ("SPCC") Plan ("Plan") for construction projects in the United States. The purpose of this Plan is to reduce the probability and risk of a potential spill or release of oil or hazardous materials by the Company or Contractor during construction-related activities, by providing training to the Company and Contractor and expediting spill response and cleanup. This plan is not intended to meet the requirements of existing facility operations.

The Plan's specific objectives are to identify and address:

- The type and quantity of material handled, stored, or used on site during construction;
- The measures to be taken for spill preparedness and prevention;
- Emergency response procedures;
- Spill incident reporting/notification procedures; and
- Local emergency response team arrangements.

This plan has been prepared to meet the requirements of the Federal Energy Regulatory Commission's ("FERC's") *Upland Erosion Control, Revegetation, and Maintenance Plan* (Plan) and *Wetland and Waterbody Construction and Mitigation Procedures* (Procedures), the Oil Pollution Act ("OPA"), the Federal Water Pollution Control Act ("FWPC"), the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA") of 1980, the Resource Conservation and Recovery Act ("RCRA"), the Toxic Substances Control Act ("TSCA") and the Clean Water Act ("CWA").

The Company Environmental Construction Permitting ("ECP") group is responsible for the development and maintenance of this Plan. The Plan will be distributed to the Company Engineering & Construction ("E&C") Department's teams and associated Company personnel and will be included in the construction contract. It is the responsibility of the E&C teams to distribute to any necessary Contractors for implementation.

This Plan outlines both Company and Contractor responsibilities by topic. The Contractor is responsible for implementation of the Plan. In the absence of a Contractor, the Company will be responsible for both Company and Contractor responsibilities as they are laid out in this Plan.

A copy of the Plan must be on site during active construction and should also be maintained at the closest construction field office.

2.0 TRAINING

The Company requires all Contractor and Company personnel engaged in any construction activity to receive training in the implementation of the Plan prior to the commencement of on-site construction related activities.

Site visitors are to be given a brief review of the Plan as part of their orientation on safety and emergency procedures prior to the start of any on-site activities.

Contractor Responsibility

The Contractor will be responsible for the following:

- Keep training records
- Perform training briefings through ongoing meetings like tailgates and the daily project Job Safety Analysis ("JSA") that include:
  - Precautionary measures to prevent spills;
  - Potential sources of spills, including equipment failure or malfunction;
  - Standard operating procedures in the event of a spill;
  - Applicable notification requirements;
  - Equipment, materials and supplies available for clean-up of a spill;
  - Hazardous waste identification procedures;
  - Generation and proper handling of all non-hazardous waste, hazardous waste, and other toxic substances;
  - Proper storage, labeling, transportation and disposal of non hazardous and hazardous waste; and
  - Sample collection procedures.

Company Responsibility

The Company Chief Inspector ("CI"), Environmental Inspector ("EI"), or their designate will perform the following:

- Teach awareness-level training at the initial project environmental training session;
- Ensure further training is available for other new project personnel; and
- Audit training records kept by the Contractor as necessary.

3.0 PRE-PLANNING - MATERIAL INVENTORY AND DOCUMENTATION

Contractor Responsibility

The Contractor will be responsible for the following **prior** to the start of construction:

- Develop an inventory of all oil/hazardous material stored or used during construction;
- Complete Tables I, II, IV, V and VI (see Appendix A);
- Obtain material safety data sheets ("MSDS") (Appendix B) for all hazardous and non-hazardous substances listed in Table I (see Appendix A);
- Prepare a basic facility diagram or sketch for any storage areas, including pipe yards and temporary storage areas. The diagram should include locations of oil-filled containers, direction of run-off, emergency evacuation routes and assembly areas (see Appendix E); and
- Submit the required Tables, MSDS, and signature pages to the ECP's Environmental Lead for review and approval.

Company Responsibility

- Complete Tables III (see Appendix A);
- Review the Tables, MSDS, and signature pages submitted by the Contractor for approval; and
- Distribute approved Tables, MSDS, and signature pages to include in Plan as Appendices A, B and D.
- Fill out any signature pages or forms (see Appendix D)
    - Management Approval and Cleanup Commitment
    - Certificate of Determination of Substantial Harm Criteria

4.0 SPILL AND LEAK PREPAREDNESS AND PREVENTION

4.1 Prevention and Preparedness

Contractor Responsibility

- Complete Appendix A, Table I, Material and Waste Storage Inventory, and Table VI, Areas for Potential Leaks and Spills, prior to construction;
- Provide spill prevention, containment, and clean up equipment, and keep it available on-site;
- Perform daily inspections of all equipment, storage tanks, and/or container storage areas;
- Repair all leaking equipment, machinery or tools immediately. If items cannot be repaired, remove them immediately from the project site;
- Maintain a minimal spill kit (absorbent diapers, plastic bags, gloves, etc.) for each piece of hydraulically operated equipment and personnel vehicles within the project area;
- Store materials as indicated in the storage facility diagram or sketch provided by the Contractor in Appendix E;
- Submit a secondary containment plan for any hazardous material storage within the project area to the Company for approval **prior** to storage; and
- Obtain written approval from the project CI or EI for hazardous material storage within 100 feet of a wetland or waterbody.

Company Responsibility

- Review any secondary containment or storage plans submitted by the Contractor for approval.

4.1.1 Secondary Containment

Contractor Responsibility

- PCB (50 parts per million (“ppm”) or greater) storage tanks shall be double-walled or have secondary containment that will hold 200 percent of the tank capacity;
- All containers with a storage capacity greater than 55 gallons shall have temporary containment (see Appendix A, Table I for type of temporary containment); and
- Pumps and other portable fuel burning equipment used within 100 feet of a jurisdictional wetland or waterbody will be placed and operated within appropriate secondary containment systems to prevent spills. Secondary containment will hold at least 110% of the tank capacity of the largest tank inside the containment area.

4.1.2 Storage/Inspection (Tanks/Containers)

Contractor Responsibility

- Operate only those tanks for fuel and material storage that meet the approval of the Company;
- Elevate tanks a maximum of two feet above grade;
- Inspect vehicle-mounted tanks to ensure all are equipped with flame/spark arrestors on all vents to prevent self-ignition;
- Locate tank storage in areas that are at least 100 feet from all waterbodies, wetlands, and designated municipal watershed areas, with certain exceptions as approved by ECP and listed in Appendix A, Table IV;
- Complete Appendix A, Table IV, Tank and Container Storage Exception Areas, and submit to the Company for approval prior to construction;
- Inspect all tanks daily for leaks and deterioration. The results of all inspections shall be made available to the Company upon request;
- Do not store incompatible materials in sequence in tanks prior to decontamination (A general list of potentially incompatible materials that may be used during construction are included in Appendix A, Table I);
- Store small cans of gasoline, diesel, solvents, etc., within the temporary secondary containment or within secured trailers or vehicles when not in use;
- Replace leaking and/or deteriorated containers as soon as the condition is first detected; and
- Ensure that all container storage and containment areas being used to store hazardous materials or wastes are in compliance with applicable local, state and federal requirements.

4.1.3 Loading/Unloading Areas

Contractor Responsibility

- Transfer liquids and refuel only in pre-designated and pre-approved locations that are at least 100 feet from all waterbodies and wetlands, with certain exceptions as approved by the EI and listed in Appendix A;
- Inspect the area beneath loading/unloading location for spills before and after each use;
- Utilize drip pans at all hose connections while loading/unloading liquids. If a leak or spill occurs, the loading/unloading operation will be stopped and the spill will be contained, cleaned up and collected prior to continuing the operation;
- Inspect all outlets of the tank trucks prior to leaving the loading and unloading area to prevent possible leakage from the truck while in transit;
- Equip any service vehicle used to transport lubricants and fuel with an emergency response spill kit. At a minimum, this kit must include:
  - 25 lbs of granular oil absorbent
  - 10, 48" x 3" oil socks

  - 5, 17" x 17" oil pillows
  - 1, 10" x 4" oil boom
  - 20, 24" x 24" x 3/8" oil mats
  - Garden size, 6 mil, polyethylene bags
  - 10 pair of latex gloves
  - 1, 55-gallon polyethylene open-head drum;
- Equip any service vehicle used to transport lubricants and fuel with a chemical response kit. At a minimum, this kit must include:
  - 1 bag of loose chemical pulp
  - 2 to 3, 17" x 17" chemical pillows
  - 2, 48" x 3" chemical socks
  - 5, 18" x 18" x 3/8" adsorbent mats
  - garden-size, 6 mil, polyethylene bags
  - 10 pair of latex gloves
  - 1, 30-gallon polyethylene open-head drum
  - hazardous waste labels

Company Responsibility

- Personnel shall be present during loading and unloading activities.

5.0 CONTINGENCY PLAN AND EMERGENCY PROCEDURES

All Company and Contractor personnel have responsibilities for spill prevention, control, and countermeasure.

Contractor Responsibility

- Maintain adequate manpower and equipment at the pipe yard or contractor ware yard necessary to divert any spill from reaching waterbodies and wetland areas; and
- Complete Appendix A, Table I, Emergency Response and Personal Protective Equipment, with a list of emergency equipment and storage location.

Company Responsibility

- Complete Appendix A, Table III, Key Emergency Contacts, prior to construction, and update as necessary.

First Responder Responsibility

The first responder is the person who first observes a spill or release of oil or other hazardous materials to the environment.

This person will take the following steps:

- Assess the situation to determine if the situation poses an immediate threat to human health or the environment;
- Identify hazardous material involved, if any;
- Report the spill to the Company Spill Coordinator ("Company SC") and Contractor Spill Coordinator ("Contractor SC") immediately; and
- Standby at a safe distance and keep others away.

Contractor SC Responsibility

- Coordinate the response to all spills which occur as a result of Contractor operations;
- Report the spill to the Company;
- Coordinate with the Company SC; and
- Conduct subsequent site investigations and associated incident reports unless otherwise directed by the Company.

The Contractor SC may be removed by the Company SC as spill response coordinator at the discretion of the Company.

The Contractor SC will direct Contractor personnel to:

- Shut off source of spill or leak as quickly as possible;
- Minimize affected area with appropriate containment or dike/berm;
- Assemble required spill response equipment as required (protective clothing, gear, heavy equipment, pumps, absorbent material, empty drums, etc.);
- Ensure that spilled material is placed in appropriate containers, in accordance with the best management practices and applicable laws and regulations;
- Properly label and store containers in accordance with applicable requirements; and
- Ensure that all spill response equipment is fully functional. Any equipment that cannot be reused shall be replaced.

Company SC Responsibility

The Company SC will be responsible for overseeing the Contractor SC's clean up of all spills of oil or hazardous materials.

Upon notification, the Company SC shall:

- Assess situation for potential threat to human health, environment and the neighboring community;
- Implement evacuation, if necessary;
- Activate emergency shutdown, if necessary;
- Control source as conditions warrant;
- Ensure that incompatible materials are kept away from the impacted area;
- Keep any potential ignition source away from the impact area, if spilled material is flammable;
- Coordinate sampling, disposal and equipment decontamination with Environmental Health and Safety ("EHS") in Houston, if necessary;
- For spills of PCBs, contact EHS for special spill response requirements related to PCB spills;
- Assist with the coordination of cleanup and disposal activities;
- If necessary, contact outside remediation services, in coordination with EHS, to assist with clean up;
- Notify EHS of all quantities and description of wastes to be handled by EHS;
- Complete the *EH&S Incident Investigation Form* (see Appendix C) and distribute accordingly;
- For unanticipated release of hydrostatic test waters, notify state contact if required by state permit, in accordance with timeframes required by state permit;
- Review permits to determine if immediate water sampling of test water is required and arrange if necessary; and
- Determine if local Right of Way agent will notify public officials (e.g. township manager and/or mayor).

6.0 SPILL CLEAN-UP/WASTE DISPOSAL PROCEDURES OF HYDROSTATIC TEST WATER

6.1 Oil/Fuel a;nd Hazardous Material Spills and Unanticipated Releases

Contractor Responsibility

- Ensure no immediate threat to surrounding landowners or environment;
- Identify/verify the material and quantity released;
- Review MSDS to determine the proper handling;
- Ensure that Personal Protective Equipment and containers are compatible with the substance;
- Remediate small spills and leaks as soon as feasible. Use adsorbent pads whenever possible to reduce the amount of contaminated articles;
- Restrict the spill by stopping or diverting flow to the oil/fuel tank;
- If the release exceeds the containment system capacity, immediately construct additional containment using sandbags or fill material. Every effort must be made to prevent the seepage of oil into soils, wetlands and surface waters;
- Block off drains and containment areas to limit the extent of the spill. For chemical spills, never wash down a spill with water;
- If a release occurs into a storm drain or stream, immediately pump any floating layer into drums. For high velocity streams, place oil booms or hay bales between the release area and the site boundary and downstream of affected area. As soon as possible, excavate contaminated soils and sediments within approved work areas;
- Collect and reclaim as much of the spill as possible using a hand pump or similar device. Containerize contaminated soils in an appropriate Department of Transportation (“DOT”) container in accordance with applicable requirements. Never place incompatible materials in the same drum;
- For larger quantities of soils, construct temporary waste piles using plastic liners placing the contaminated soils on top of the plastic and covered by plastic. Plastic-lined roll-off bins should be leased for storing this material as soon as feasible;
- Properly label any drums, containers or storage piles in accordance with applicable requirements;
- Move drum to secure staging or storage area;
- Decontaminate all equipment in a contained area and collect fluids in drums;
- Document and report cleanup activities to the Company SC as soon as feasible; and
- If environmentally sensitive resources (wetlands, waterbodies) exist in the area, ensure that Best Management Practices as described in Company’s Erosion &Sedimentation Control Plan (“E&SCP”) are utilized to minimize impact to these resources.

Company Responsibility

- If necessary, arrange for sampling the substance for analysis and waste profiling, according to instructions from the Company Standard Operating Procedures, and/ or EHS;
- Document and report activities to EHS as soon as feasible.

6.2 Disposal of Contaminated Materials/Soils

For Company and Contractor protocol on the disposal of contaminated materials, soils, or any other waste materials, please see the Company Waste Management Plan.

6.3 Notification

Company Responsibility

- The Company SC shall notify the Emergency Spill Hotline at (800) 735-6364 and those listed in Appendix A, Table III, immediately for spills that meet any of the following criteria:
  - one pound or more of a solid material (excluding Horizontal Directional Drill ("HDD") mud) spilled on land;
  - five gallons or more of a liquid spilled on land;
  - creates a sheen on water; or
  - unanticipated release of hydrostatic test water.
- If necessary, notify the local fire department, law enforcement authority, or health authority as appropriate. The following information should be provided:
  - the name of the caller and callback number;
  - the exact location and nature of the incident;
  - the extent of personnel injuries and damage;
  - the extent of release; and
  - the material involved and appropriate safety information.
- An incident report form should be filled out following containment and cleanup of the spill or release. Incident data should be gathered using the *EH&S Incident Investigation Form* (see Appendix C) and should be sent to the appropriate ECP project manager for records retention and entry into the EPASS/ILP database.

7.0 HOUSEKEEPING PROGRAM

7.1 Construction Area

Contractor Responsibility

- Maintain construction area in neat and orderly manner; and
- Routinely collect and properly dispose of all trash off-site.

7.2 Contractor Yards/Ware Yards

Contractor Responsibility

- Produce a "site specific" plan to address storage, spill prevention and overall yard organization for all contractor yards and ware yards. Contractor yard "site specific" plans should include the following:
  - facility name;
  - physical address;
  - longitude and latitude coordinates;
  - directions to facility (including road names);
  - date of first oil and hazardous material storage;
  - location of oil and hazardous material containers greater than 55 gallons;
  - loading/unloading areas;
  - direction of drainage flow; and
  - primary and secondary evacuation routes.
- Provide adequate aisle spacing to allow unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment as necessary in storage areas;
- Ensure similar housekeeping practices enforced in construction areas are also implemented in storage areas; and
- Any facility with an aggregate aboveground oil storage capacity greater than 1,320 US gallons but less than 10,000 gallons must have the plan self-certified by the owner or operator of the qualified facility or a licensed Professional Engineer. Any facility with an aggregate aboveground oil storage capacity greater than 10,000 gallons must have the plan reviewed and certified by a licensed Professional Engineer.

7.3 Security

Contractor Responsibility

- Hazardous wastes and waste containing PCBs greater than 50 ppm will be stored in a secured location (i.e. fenced, locked, etc.). Fuel storage areas will be located to minimize, as much as possible, tampering by unauthorized personnel during non-operational hours.
- Complete Table V, Waste Storage Security Information, in Appendix A, prior to construction.

Company Responsibility

- Review Table V, Waste Storage Security Information in Appendix A, that has been prepared by the Contractor prior to construction.

Project Signatures:

Company Spill Coordinator:

Print Name

Signature Date

Contractor Spill Coordinator

Print Name

Signature Date

APPENDIX A - TABLES

TABLE I – MATERIAL AND WASTE INVENTORY

Oil and Fuel to be used or stored on site during construction:

STORAGE CAPACITY OF OIL FILLED-CONTAINERS

Container Number[a/]	Storage capacity (volume)	Location

[a/] The reference container numbers should correspond to the facility diagram in Appendix E.

Commercial Chemicals to be used or stored on site during construction:

Hazardous and Non-Hazardous Wastes to be used or stored on site during construction:

Incompatible Materials to be used or stored on site during construction:

Type of Temporary Containment containers to be used:

TABLE I TO BE COMPLETED BY CONTRACTOR
Prior to the Start of Construction and updated as necessary

TABLE II – EMERGENCY RESPONSE AND PERSONAL PROTECTIVE EQUIPMENT

Spill Response:

Equipment	Quantity	Location

Fire Protection:

Equipment	Quantity	Location

Personnel Protection:

Equipment	Quantity	Location

TABLE II TO BE COMPLETED BY CONTRACTOR
Prior to the Start of Construction and updated as necessary

TABLE III – KEY EMERGENCY CONTACTS

The list of key personnel who will be contacted in the event of an emergency or spill incident include:

1. ***Company Emergency Contacts*** Contact Name Phone Number

Company Spill Coordinator & Environmental
Inspector (within 15 minutes identifying of incident)

24-hour Emergency Spill Hotline -- 1-800-735-6364
(within 15 minutes of identifying incident)

Regional Environmental Coordinator
(within 15 minutes of identifying incident)

ECP's Project Environmental Lead / PM
(notify within 60 minutes of incident & submit
Spill Report Form within 24 hours to ECP PM)

Company Project Manager

Company Environmental Coordinator

Field Construction
Company Construction Coordinator

2. ***Contractor Emergency Contact***

Contractor Spill Coordinator

3. ***Local Authorities*** – As necessary

Emergency contact for Police, Fire & Medical assistance ***Dial 911***

Non-Emergency Local Authorities or Contacts		
Location	**Contact**	**Phone Number**

4. ***Environmental Agencies***

Notification to be made by Regional Environmental Coordinator and ECP's PM

5. ***Potential Environmental Remedial Service Contractors***

Clean Harbors Environmental Services, Inc.	Howard Alexander	(800) 782-8805
Safety-Kleen (FS), Inc	Edward A. Mitchell	(281) 478-7700
U.S.A. Environment	Cesar Garcia	(713) 425-6925 or (832) 473-5354
WRS Infrastructure and Environment Inc	Steve Maxwell	(281) 731-0886

TABLE III TO BE COMPLETED BY COMPANY
Prior to the Start of Construction and updated as necessary

TABLE IV – TANK AND CONTAINER STORAGE EXCEPTION AREAS

Tank and container storage shall be located in areas that are at least 100 feet from all waterbodies and wetlands.

The below exceptions have been approved by ECP and EHS:

1.

2.

3.

4.

TABLE IV TO BE COMPLETED BY CONTRACTOR
Prior to the Start of Construction and updated as necessary

TABLE V – WASTE STORAGE SECURITY INFORMATION

TABLE V TO BE COMPLETED BY CONTRACTOR
Prior to the Start of Construction and updated as necessary

TABLE VI–AREAS FOR POTENTIAL LEAKS AND SPILLS

1.

2.

3.

4.

TABLE VI TO BE COMPLETED BY CONTRACTOR Prior to the Start of Construction and updated as necessary

APPENDIX B - MSDS

APPENDIX C – EH&S INCIDENT INVESTIGATION FORM

HSF-004 1/1/2011
AVAILABLE ELECTRONICALLY

Enbridge, Inc.

EHS Incident Investigation/Data Collection Form

This form replaces: C-23 Occupational Injury and Illness Report, 19-06 Field Spill Report, 19-20 Outside Agency Inspection, 19-21 Natural Gas Release Record, and 19-25 Contamination Encounter Report

(Must Be Completed)

BUSINESS UNIT	REGION (Circle One)	AREA	LOCATION (Entity)
US	Northeast / Southeast / Corporate		

Complete each section and field as applicable for the Incident Type you are entering. *All required fields **(bold)** are EPASS ILP system required and must be completed.*

Incident Type: ☐ Injury / Illness ☐ Vehicle ☐ Environmental ☐ Complaint ☐ Near Miss
(Check multiple incident types as appropriate)

Category: ☐ Incident with Loss ☐ Incident without Loss Initiating Event: _____

Status: Open ☐ **Do not include in rates and counts:** ☐ Note: (Pertains to all incidents without loss.)

Date Reported: _____ **Date Occurred:** _____ Time Occurred: _____ AM ☐ PM ☐

Describe exactly how the incident occurred. Be very specific in details without reference to individual(s) names.

Common fields applicable to all types of incidents.

Employee Name: _____ **Incident Owner (Supervisor) Name:** _____

Contractor Incident: ☐ Yes ☐ No **Dependent** ☐ **Independent** ☐

Contract Employee Name: _____ **Phone Number:** _____

Contractor Contact Name: _____ **Contractor Company Name:** _____

Contractor Address, City, State, Zip code _____

Time Work Began: _____ AM ☐ PM ☐ **Time work began cannot be confirmed:** ☐

Response Agency Involved: ☐ Police ☐ Fire ☐ Ambulance ☐ HazMat ☐ Insurance ☐ External Response Support

Emergency Response Coordination: ☐ Internal ☐ External **Third Party Damage:** _____

Description of Immediate Response: (Note: This information is included in the ILP e-mail initial incident notification.)

Section A

Injury / Illness Incident Detail **SRS TeleClaim Contact #: 1-866-880-1777** Enbridge, Inc. Account #: 57568

Classification: ☐ First Aid ☐ Medical Treatment ☐ Modified / Restricted Work ☐ Lost Time ☐ Fatality

NOTE: Contact Human Resources to determine if Certificate of Disability is appropriate.

Event/Exposure (i.e. fall, slip/trip, strain) _____ **Injury source (i.e. tool, chemicals)** _____

Body Part (i.e. R/L leg, hand, back) _____ **Nature of Injury (i.e. cut, bruise, burn)** _____

Reported to Case Manager / SRS : ☐ Yes ☐ No **OSHA Log Injury Type(i.e. injury, illness, hearing loss)** _____

OSHA Log Injury Short Description: _____

Section B

Vehicle Incident Detail Driver **MUST CALL** PHH @ 800-446-7052 and provide vehicle unit #.
For any other claims, contact SRS Teleclaim @ 866-880-1777 w/Enbridge, Inc. Account #: 57568

Vehicle Type: (i.e. car, pickup) _____ **Ownership (i.e. company, rental)** _____

Activity (i.e. turning, passing, backing): _____ **Location:(i.e. urban, ROW, highway):** _____

Collision Location (i.e. ROW, parking lot, intersection) _____ **Road Type (i.e. concrete, dirt)** _____

Contributing Factors (i.e. failure to yield, keep safe distance): _____

Traffic Controls (i.e. stop sign, traffic signal, railroad crossing): _____

Collision Type i.e. backing, turning, rear ended) _____ **Collision Object (i.e. vehicle, animal, object)** _____

Road Conditions (i.e. dry, wet, ice, snow) _____ **Weather Conditions (i.e. rain, snow, clear)** _____

Journey Purpose (i.e. Business, Personal, T/F Work) _____ Lighting (i.e. dawn, day, night): _____

Third Party Name _____ Address: _____

Environmental Incident Detail

Section C

Spill/release Source: _____ **Reportable:** ☐ Yes ☐ No **Unplanned Release:** ☐ Yes ☐ No

Unexpected Contaminated Soil Encountered: ☐ Yes ☐ No

Medium: ☐ Air ☐ Containment ☐ Ground ☐ Treatment System ☐ Water

Units: ☐ Gallons ☐ Pounds ☐ mmscf (millions) ☐ mcf (thousands) **Spill / Release Amount:** _____

Material (i.e. natural gas, oil, pipeline condensate, glycol) _____ Occur near wetlands: ☐

Environmental Impact: _____ Wind: Direction: _____ Speed: _____ Temperature: _____

Line Size: _____ Line Pressure: _____ Start Time: _____ End Time: _____

Section D

Transportation Incident Detail

Type of Shipment:

☐ Hazardous Material Shipment ☐ Undeclared shipment with no release ☐ Specification cargo tank

Type of Report: ☐ Initial Report ☐ Follow-up Report

Mode of Transportation: ☐ Air ☐ Highway/Roadway ☐ Rail ☐ Water

Spill Occurred: ☐ In transit ☐ Loading ☐ Unloading ☐ In Transit Storage

Carrier: _____ **Shipper:** _____

Spill Location - Address, City, State, Zip code: _____

Hazardous Material: _____ **Quantity:** _____ **Units (i.e. gallons)** _____

Comments: _____

Section E

Regulatory Information / Notification / Outside Agency Inspection Detail

Regulatory Notification: ☐ **Date:** _____ **Routine Inspection:** ☐ **Tests conducted:** ☐ **Explain:** _____

Regulatory Agency: _____ **Officer Name:** _____

Warning Issued: ☐ **Fine Issued:** ☐ **Amount:** _____ **Order / NOV Issued:** ☐ **Date:** _____

Reference #: _____ **Extension:** ☐ **Date:** _____ **Rescind:** ☐ **Date:** _____

Found During Inspection: ☐ **Suspect Soil:** ☐ **Sampling Required:** ☐ **Permit Exceedance:**

Accompanied by (name): _____ **Comments:** _____

Section F

EHS Complaint Detail

Complaint type (i.e. noise, odor, property damage): _____ ☐ New ☐ Ongoing

Parameters of Concern: _____

Attach any additional doctor injury status, police or agency reports as appropriate for the incident.

FAX OR EMAIL THIS DOCUMENT TO YOUR REGION EHS SPECIALIST for data entry into ILP within 24 hours of an environmental or safety incident AND fax a copy to Houston EHS at 713-386-4249.

Reported by: _____ Signature: _____ Phone: _____

Causal Factors (TapRoot®) and Corrective Actions*

(Contact Region EHS Specialist for help in completing this section.)
(EHS Specialist will utilize the most current version of the TapRoot® Root Cause Tree® Dictionary*)

Section G

ILP Incident #: _____ **Investigation End Date:** _____

It is essential to record the unique identifying number from the ILP database.

Risk Rank: ☐ 1 ☐ 2 ☐ 3 ☐ 4 (Check only one box.)
(See Risk Matrix)

TapRoot® Cause Outcome*

Causal Factor: A problem or issue that, if corrected, could have prevented and incident from occurring or significantly reduced the incident's consequences.*

Effective Corrective Action is **SMART**, effective, and reviewed for unintended consequences.*

Specific
Measureable
Accountable
Reasonable
Timely

1. Identify causal factors - up to 4 cause codes. (Free form text.)
2. Select from the following menu. Note: the line number on this form relates to text on the drop down menu in the ILP database. The number is not found in ILP.

Section H

No. Cause Code Menu (Not inclusive of all TapRoot® Cause Codes*)

1	Human Performance Difficulty	Procedures	Not Used/Not Followed
2	Human Performance Difficulty	Procedures	Wrong
3	Human Performance Difficulty	Procedures	Followed Incorrectly
4	Human Performance Difficulty	Training	No Training
5	Human Performance Difficulty	Training	Understanding NI (Needs Improvement)
6	Human Performance Difficulty	Quality Control	No Inspection
7	Human Performance Difficulty	Quality Control	QC NI (Quality Control Needs Improvement)
8	Human Performance Difficulty	Communications	No Communication or Not Timely
9	Human Performance Difficulty	Communications	Turnover NI
10	Human Performance Difficulty	Communications	Misunderstood Verbal Communication
11	Human Performance Difficulty	Management System	SPAC NI (Standard Practices and Controls Need Improvement)
12	Human Performance Difficulty	Management System	SPAC Not Used (Standard Practices and Controls Not Used)
13	Human Performance Difficulty	Management System	Oversight/Employee Relations
14	Human Performance Difficulty	Management System	Corrective Action
15	Human Performance Difficulty	Human Engineering	Human/Machine Interface
16	Human Performance Difficulty	Human Engineering	Work Environment
17	Human Performance Difficulty	Human Engineering	Complex System
18	Human Performance Difficulty	Human Engineering	Non Fault Tolerant System
19	Human Performance Difficulty	Human Engineering	Preparation
20	Human Performance Difficulty	Work Direction	Selection of Worker
21	Human Performance Difficulty	Work Direction	Supervision During Work
22	Equipment Difficulty	Tolerable Failure	
23	Equipment Difficulty	Design	Design Specs
24	Equipment Difficulty	Design	Design Review
25	Equipment Difficulty	Design	Independent Review NI (Needs Improvement
26	Equipment Difficulty	Equipment/Parts Defective	Procurement
27	Equipment Difficulty	Equipment/Parts Defective	Manufacturing
28	Equipment Difficulty	Equipment/Parts Defective	Handling
29	Equipment Difficulty	Equipment/Parts Defective	Storage
30	Equipment Difficulty	Equipment/Parts Defective	Quality Control
31	Equipment Difficulty	Preventive/Predictive Maintenance	PM NI (Preventive Maintenance Needs Improvement)
32	Equipment Difficulty	Repeat Failure	Management System
33	Natural Disaster	Sabotage	
34	Other		

Complete the Causal Factors and Cause Code on page 4.

Causal Factors free form text box. Cause Code Number i.e. 1 through 34

Section H

Causal Factor 1: _____

- **Cause Code Number:** _____
- **Cause Code Number:** _____
- **Cause Code Number:** _____

Causal Factor 2: _____

- **Cause Code Number:** _____
- **Cause Code Number:** _____
- **Cause Code Number:** _____

Causal Factor 3: _____

- **Cause Code Number:** _____
- **Cause Code Number:** _____
- **Cause Code Number:** _____

Causal Factor 4: _____

- **Cause Code Number:** _____
- **Cause Code Number:** _____
- **Cause Code Number:** _____

Section I

Corrective Action Information:

Title: _____

Author: _____

Author Date: _____

Origin Cause: _____

Proposed Corrective Action: _____

Proposed Completion Date: _____

Assigned to: _____

Actual Corrective Action: _____

Actual Completion Date: _____

After the investigation is complete, and when a corrective action is developed, ensure the causal factors, codes and corrective action information in this document is sent to the person responsible for data entry into ILP i.e. Region EHS Specialist or Supervisor.

FAX OR EMAIL THIS DOCUMENT TO YOUR REGION EHS SPECIALIST for data entry into ILP AND fax a copy to Houston EHS at 713-386-4249.

Prepared by: _____ Signature: _____ Phone: _____

DISTRIBUTION:

Original - Station ENV File 9.2 or 10.0
Original - S&H File # 22.1, 22.2, or 22.5 as appropriate per H&S SOP
Copy - Region EHS
Copy - Houston EHS - fax 713-386-4249
Copy - Houston Fleet Services

RETENTION:

Original - See SOP 3 or 5 years
Original - See EHS Retention Rule
Copy - As needed
Copy - Permanent
Copy - As needed

ENBRIDGE, INC. EHS RISK MATRIX

Frequency	Likelihood *(facility, region, major project)*	Likelihood Category		C1	C2	C3	C4	C5
> 1/yr	Expected to occur more than once per year at a facility/project	▲	L5	III	II	II	I	I
>1/10yrs	Expected to occur several times in facility/project lifetime		L4	III	III	II	II	I
>1/100yrs	Expected to occur once in the facility/project lifetime		L3	IV	III	III	II	II
>1/1,000 yrs	May occur in the facility/project lifetime		L2	IV	IV	III	III	II
>1/10,000 yrs	Remote chance of happening		L1	IV	IV	IV	III	III
				Consequence Category →				
Consequence			**Injury Outcome**	First Aid or Minor Illness	Medical Aid / OSHA Recordable Restricted Work.	Lost Time Injury	Permanent Disability	Fatality
			Environment	Insignificant onsite / localized impact	Negligible onsite or offsite impact below	Environmental impact resulting in regulatory	Significant impact leading to enforcement	Catastrophic impact, long-term liability,
			Financial	<$1K	$1-10K	$10-100K	$100K-$1M	>$1M
			Reputation	Individual concern, no media attention	Community concern with local media attention	State / Provincial concern with regional media attention	Response causing impact on share price	Response causing major impact on share price

Risk Ranking	Guideline Interpretation
I	It is recommended that no activity be permitted without immediate mitigation taken to lower the risk rank.
II	Further risk controls should be considered to lower either the probability or consequence of the risk.
III	Some risk controls may be required.
IV	No further reduction in risk is required.

APPENDIX D – REQUIRED SIGNATURE FORMS

Management Approval and Cleanup Commitment
40 CFR §112.7

This Spill Prevention, Control and Countermeasures Plan (Plan), including the Spill Procedures Chart and Supplemental Document, which has been prepared in accordance with 40 CFR 112, has been reviewed and approved by the Project Manager. The Project Manager has the level of authority to commit the necessary resources to fully implement this Plan and to contain and clean up any oil discharged at this facility. By signing below, the **Project Manager** also **authorizes station supervisors to expediently commit manpower, equipment, and materials necessary to contain and remove any harmful quantity of oil discharged from this facility** (40 CFR §112.7). **This commitment includes the authority to use company and/or contract personnel and equipment.**

Facility Name: _____

Location: _____

Signature: _____

Name: _____

Date: _____

Title: _____

ENBRIDGE

CERTIFICATE OF DETERMINATION OF SUBSTANTIAL HARM CRITERIA

Facility Name: _____

Location: _____

Does the facility transfer oil over water to or from vessels and does the facility have a total oil storage capacity greater than or equal to 42,000 gallons? Yes___ No ___

Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and does the facility lack secondary containment that is large enough to contain the capacity of the largest aboveground oil storage tank plus sufficient freeboard to allow for precipitation within any aboveground oil storage tank area?
Yes___ No ___

Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula in rule 40 CFR 112 Attachment C-III or a comparable formula) such that a discharge from the facility could cause injury to fish and wildlife and sensitive environments? For further description of fish and wildlife and sensitive environments, see Appendices I, II, and III to DOC/NOAA's "Guidance for Facility and Vessel Response Plans: Fish and Wildlife and Sensitive Environments" (see Appendix E to this Part, Section 13, for availability) and the applicable Area Contingency Plan.

Yes___ No ___

Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula in Attachment C-III to this appendix or a comparable formula) such that a discharge from the facility would shut down public drinking water intake? For the purpose of 40 CFR 112, public drinking water intakes are analogous to public water systems as described in 40 CFR 143.2(c)

Yes___ No ___

Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and has the facility experienced a reportable oil discharge in an amount greater than or equal to 10,000 gallons within the last five years?

Yes___ No ___

Certification

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals responsible for this information, I believe that the submitted information is true, accurate, and complete.

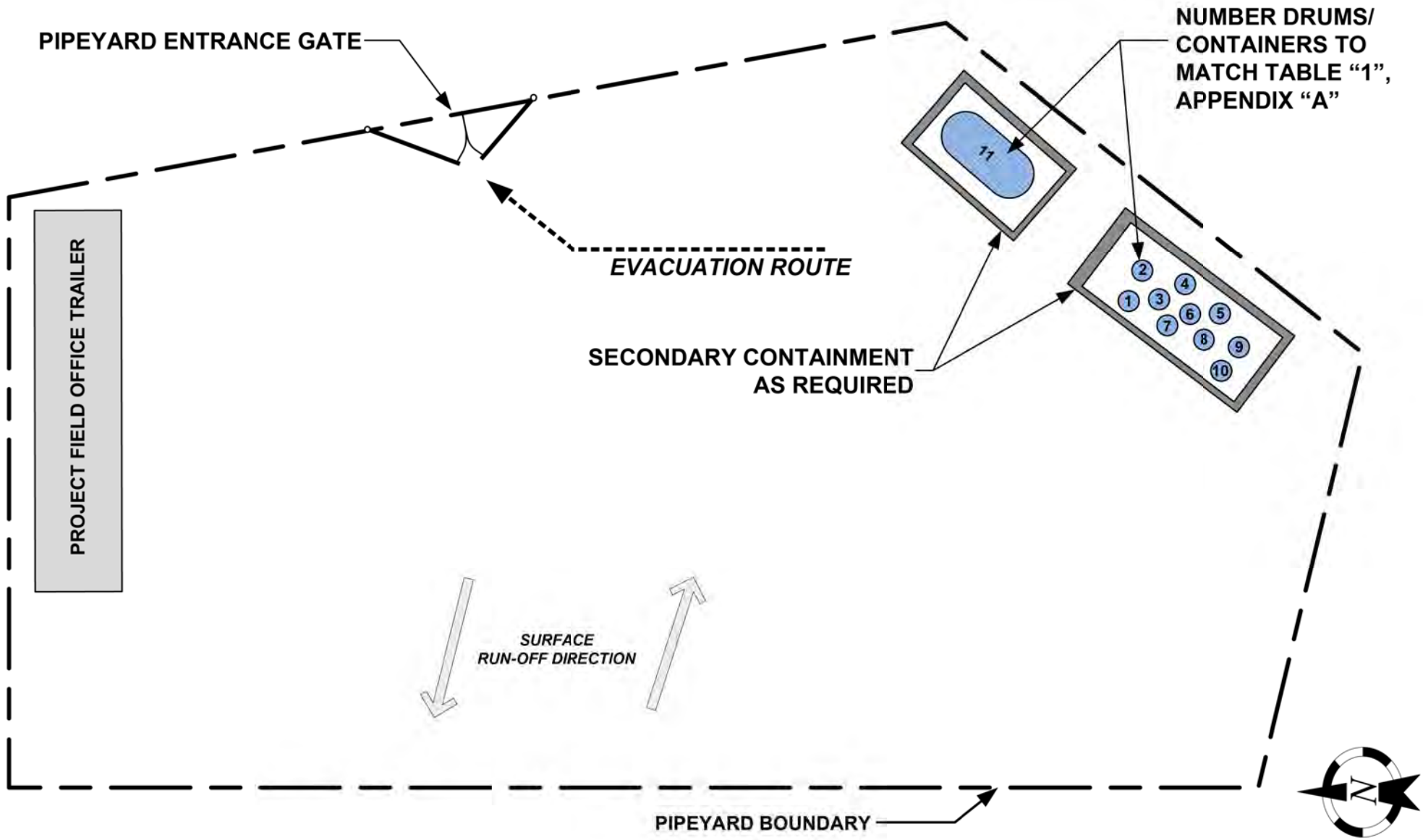
Signature: _____

Title: _____

Name (please type or print): _____

Date: _____

APPENDIX E – PIPEYARD / FACILITY STORAGE DRAWING



LEGEND

- PIPEYARD BOUNDARY
- STORAGE CONTAINERS
- OFFICE TRAILER

SAMPLE
PIPEYARD: FACILITY STORAGE DRAWING

REV.	REV. DATE		REV. APRVD.
CKD.BY	ENG.	DATE 1/6/2011	W.O.
DRN.BY J.M.F.	SCALE NONE	DWG.NO .	

ENBRIDGE
5400 Westheimer Ct.
Houston, TX. 77056-5310
713.627.5400

Attachment D
Algonquin's Best Drilling Practices Plan

Sakonnet River Pipeline HDD Replacement Project

Best Drilling Practices, Monitoring and Clean-up of Horizontal Directional Drilling Inadvertent Returns

August 2023

TABLE OF CONTENTS

1.0 INTRODUCTION

Algonquin Gas Transmission, LLC ("Algonquin") developed the enclosed Best Drilling Practices Plan for monitoring and clean-up of the horizontal directional drilling ("HDD") inadvertent returns ("HDD Plan"). This HDD Plan will be kept on-site at HDD locations and will be available and implemented by all proposed personnel described in the following sections of this HDD Plan. All drilling during each pipeline installation will be managed in accordance with this HDD Plan. In addition, prior to initiation of the HDD activities, Algonquin will provide timely notification to the appropriate regulatory agencies, landowners, and FERC, as applicable, of the planned activities and estimated timeframes.

2.0 BEST AVAILABLE DRILLING PRACTICES

2.1 Description of the Work

The HDD method typically involves establishing land-based staging areas along both sides of the proposed crossing. The process commences with the boring of a pilot hole beneath the feature (e.g., waterbody, roadway) to the opposite side of the crossing and then enlarging the hole with one or more passes of a reamer until the hole is the necessary diameter to facilitate the pull-back (installation) of the pipeline.

Once the reaming passes are completed, a prefabricated pipe segment is then pulled through the hole to complete the crossing. While the HDD method is a proven technology, there are certain impacts that could occur as a result of the drilling such as the inadvertent release of drilling fluid, which is a slurry of bentonite clay and water and is classified as non-toxic to the aquatic environment and is a non-hazardous substance. Drilling fluids that are released typically contain a lower concentration of bentonite when they surface because the bentonite is filtered out as it passes through existing sediments of varying types. The following sections provide the process of HDD and procedures to be implemented in the case of drill failure or the inadvertent release of drilling fluid.

2.2 Background

The HDD process uses bentonite-based drilling fluids. The drilling fluids are tested for specific engineering properties to ensure a successful HDD installation. An environmental impact associated with HDD is the inadvertent release of drilling fluids to the surface along the drill alignment during drilling operations.

2.3 Drilling Fluid Composition

The major component of drilling fluids used in HDD pipeline installation is fresh water, which will be obtained from municipal sources. In order for water to perform the required drilling functions, it is generally necessary to modify its properties by adding a viscosifier, which is used almost exclusively in HDD drilling fluids is naturally occurring bentonite clay typically mined by "open pit" methods.

Bentonite is soft clay, formed by the weathering of volcanic ash, with the unique characteristic of swelling to several times its original volume when mixed with water. It is not a hazardous material as defined by the U.S. Environmental Protection Agency's ("USEPA") characteristics of ignitability, corrosivity, reactivity, or commercial chemicals. It can also be used to seal earth structures (e.g., ponds or dams), and as a suspending component in livestock feeds. The

properties of bentonite used in drilling fluids are often enhanced by the addition of polymers. Enhancement typically results in increasing the yield, reducing the amount of dry bentonite required to produce a given amount of drilling fluid and augmenting its rheologic properties to maximize the effectiveness within a given formation. Non-treated bentonite yields in excess of 85 barrels (3,570 gallons) of drilling fluid per ton of material. The addition of non-toxic polymers to produce high yield bentonite can increase the yield to more than 200 barrels (8,400 gallons) per ton of material. Typical HDD drilling fluids are made with high yield bentonite and are composed of less than 4 percent viscosifier by volume, with the remaining components being water and drilled spoil. Drilling fluid consists of non-toxic bentonite, but, depending on the drilling conditions, may also contain drilling fluid additives. The bentonite and any additives must meet the National Sanitation Foundation International/American National Standards Institute ("ANSI") Standard 60 for safe drinking water requirements. This is the same drilling fluid used for drilling drinking water wells, so there is no risk to drinking water from its use.

Typically, the drilling fluid contains no more than 5 percent bentonite (95 percent fresh water). The slurry is designed to:

- Stabilize the hole against collapse;
- Lubricate, cool, and clean the cutters;
- Transport cuttings by suspension and flow to entry and exit points; and
- Reduce soil friction and required pull loads.

2.4 Drilling Fluid Disposal

Waste drilling fluid and cuttings will be collected, temporarily stored in the construction workspace, and then disposed of off-site at an approved facility. Disposal of excess drilling fluid will be the responsibility of the selected HDD contractor. Prior to beginning HDD operations, the HDD contractor will be required to submit its proposed drilling fluid disposal procedures and disposal facility to Algonquin for approval. Algonquin will review these procedures and verify that they comply with all environmental regulations, easement and workspace agreements, and permit requirements.

2.5 HDD Working Procedures

Prior to drilling operations, site-specific HDD Procedures will be prepared by the HDD contractor and submitted to Algonquin for review and approval. As a minimum, the HDD Procedures will address the following:

Annular Pressure or Release Mitigation – Once it is indicated to the driller that annular pressures are abnormally high or that a release has occurred (via use of a downhole annular pressure monitoring tool), the driller has the following options (or any combination of these options):

- Decrease pump pressure;
- Decrease penetration rate;
- Retract the drill string a distance to restore circulation ("swab" the hole);
- Introduce additional flow along the borehole using "weeper" subs; and
- Modify the drilling mud with lost circulation additives.

2.6 HDD Contingency Plan

Several possible scenarios and/or conditions exist that could prevent the successful completion of a pilot hole, reaming or pipeline pullback operation. Examples of these possible scenarios and/or conditions are as follows:

1. Inability to maintain mud circulation during pilot drilling due to uncontrolled fluid loss into subterranean voids or fissures.
2. Inability to steer the down hole pilot assembly on the prescribed drill profile due to deflection that could occur when geological obstructions such as boulders and cobble are encountered.
3. Inability to steer the down hole pilot assembly on the prescribed drill profile due to deflection that could occur in areas where a geologic formation is encountered that will not provide adequate resistance to support the weight of the down hole pilot assembly.
4. Inability to complete reaming due to geological obstructions such as boulders or cobble that could migrate into the path that has already been piloted or reamed.
5. Inability to retrieve drilling or reaming equipment components and/or drill pipe that could be left down hole due mechanical failure.
6. Inability to pull the entire product pipeline section through the bore hole due to the collapse of the completed bore hole.

In the unlikely event that a HDD bore hole profile must be abandoned Algonquin will implement one the following alternate installation procedures:

1. The pilot hole will be offset and drilled on a different profile from the same location;
2. Algonquin will relocate the HDD to another location on the existing permanent easement; or
3. Algonquin will acquire additional permanent easement to perform the HDD in an alternate location (the necessary clearance and permit amendments will be obtained prior to the initiation of this option).

In the event that a bore hole must be abandoned, the following remedial steps will be implemented:

1. The HDD contractor will fill the abandoned hole with a drilling mud/grout mixture. Once this is accomplished, Algonquin would offset to another location and resume the HDD process as specified in steps 1-3 above.
2. Drilling mud from the pit at the abandoned location will be pumped into a tank for reuse or disposal and the pit will be backfilled.

3.0 DRILLING AND MONITORING PROCEDURES

3.1 Personnel and Responsibilities

The actions in this HDD Plan are to be implemented by the following personnel:

Chief Inspector – Algonquin will designate a Chief Inspector ("CI") for the Project. The CI will have overall authority for construction activities that occur on the Project.

Environmental Inspector – At least one Environmental Inspector ("EI") will be designated by Algonquin to monitor the HDD activities. The EI will have peer status with all other activity inspectors and will report directly to the CI who has overall authority. The EI will have the authority to stop activities that violate the environmental conditions of the FERC certificate (if applicable), other federal and state permits, or landowner requirements, and to order corrective action.

HDD Superintendent – is the senior on-site representative of the HDD contractor. The HDD Superintendent has overall responsibility for implementing this HDD Plan on behalf of the HDD contractor. The HDD Superintendent will be familiar with the aspects of the drilling activity, the contents of the HDD Plan and the conditions of approval under which the activity is permitted to take place. The HDD Superintendent will make available a copy of this HDD Plan to the appropriate construction personnel. The HDD Superintendent will ensure that workers are properly trained and familiar with the necessary procedures for response to an inadvertent release.

HDD Operator – is HDD contractor's driller operating the drilling rig and mud pumps. The HDD Operator is responsible for monitoring circulation back to the entry and exit locations and for monitoring annular pressures during pilot-hole drilling. In the event of loss of circulation or higher than expected annular pressures, the HDD Operator must communicate the event to the HDD Superintendent and HDD contractor field crews. The HDD Operator is responsible for stoppage or changes to the drilling program in the event of observed inadvertent returns.

HDD Contractor Personnel – during HDD installation, field crews will be responsible to monitor the HDD alignment along with the Algonquin's field representatives'. Field crews in coordination with the EI are responsible for timely notifications and responses to observed releases in accordance with this HDD Plan. The EI ultimately must sign off on the action plan for mitigating the release.

3.2 Training

Prior to drilling, the HDD Superintendent, CI and the EI will verify that the HDD Operator and field crew receive the following site-specific training but not limited to:

- Project specific safety training;
- review provisions of this HDD Plan and site-specific permit requirements;
- review location of sensitive environmental resources at the site;
- review drilling procedures for release prevention;
- review the site-specific monitoring requirements;
- review the location and operation of release control equipment and materials; and

- review procedures for reporting observed inadvertent returns.

To ensure that HDD operations are conducted in accordance with established requirements and standard HDD industry practice, Algonquin will provide an inspector experienced in HDD construction (HDD Superintendent, see Section 4.0 below) to monitor the HDD contractor's performance at the HDD site. Established requirements to which the HDD contractor must conform include, but are not limited to, the construction drawings, technical specifications, permits, easement and workspace agreements, and HDD contractor submittals. The drilling fluid monitoring procedures to be applied will vary depending upon the following operational conditions: full circulation; loss of circulation; and inadvertent returns.

3.3 Monitoring Procedure for Full Circulation

When HDD operations are in progress and full drilling fluid circulation is being maintained at one or both of the HDD endpoints, the following monitoring procedures will be implemented:

- The presence of drilling fluid returns at one or both of the HDD endpoints will be periodically documented;
- Land-based portions of the drilled alignment will be periodically walked and visually inspected for signs of inadvertent drilling fluid returns as well as surface heaving and settlement.
- Waterways will be visually inspected from the banks for a visible drilling fluid plume; and
- Drilling fluid products present at the jobsite will be documented.

If an inadvertent drilling fluid return is detected during routine monitoring, the monitoring procedure described below will be implemented immediately.

3.4 Monitoring Procedure for Loss of Circulation

When HDD operations are in progress and drilling fluid circulation to the HDD endpoints is lost or severely diminished, the following monitoring procedure will be implemented. Lost circulation is common and anticipated during HDD installation and does not necessarily indicate that drilling fluid is inadvertently returning to a point on the surface.

- The HDD Superintendent will notify Algonquin if drilling fluid circulation to the HDD endpoints has been lost or severely diminished.
- The HDD Superintendent will document steps taken by the HDD contractor to restore circulation. If the HDD contractor fails to comply with the requirements of the HDD specification, the HDD Superintendent will notify Algonquin so that appropriate actions can be taken. If circulation is regained, Algonquin's inspector will inform Algonquin and resume the monitoring procedure described herein.
- If circulation is not re-established, the HDD Superintendent will increase the frequency of visual inspection along the drilled path alignment as appropriate. Additionally, Algonquin's Superintendent will document periods of HDD contractor downtime (during which no drilling fluid is pumped) and the HDD contractor's drilling fluid pumping rate should it become necessary to estimate lost circulation volumes.

3.5 Monitoring Procedure for Inadvertent Returns

If an inadvertent return of drilling fluids is detected, the following monitoring procedure will be implemented:

- If the HDD Operator observes an increase in annular fluid pressure or loss of circulation, the Operator will notify the HDD Superintendent and field crews of the event and approximate position of the cutting head;
- Where practical, a member of the field crew will visually inspect the ground surface near the position of the cutting head;
- If an inadvertent release is observed:
    - Field crew will notify (via hand-held radio or cell phone) the HDD Operator;
    - The HDD Operator will temporarily cease pumping of the drilling fluid and notify the HDD Superintendent and CI;
    - The CI will notify and coordinate a response with the EI;
    - The EI will notify appropriate permit authorities as necessary of the event and proposed response and provide required documentation within 24 hours; and
- The CI will prepare a report that summarizes the incident.

4.0 RESPONSE TO INADVERTENT RETURNS

Typically, inadvertent releases are most often detected in an area near the entry or exit points of the drill alignment when the pilot bore is at shallow depths, above bedrock, and in permeable/porous soils. In these occurrences the release will be assessed by the HDD Superintendent, EI and CI to determine an estimated volume and footprint of the release. They will also assess the potential of the release to reach adjacent waterbodies, wetlands, or other types of infrastructure.

The HDD Superintendent will assess the drilling parameters (depth, annular pressures, fluid flow rate and drill fluid characteristics) and incorporate appropriate changes.

The HDD Superintendent, EI, and CI will implement installation of appropriate containment structures and additional response measures. Access for personnel and equipment to the release site is a major factor in determining the methods used for containment and disposal. Typically, containment is achieved by excavating a small sump pit (5 cubic yards) at the site of the release and to surround the release with hay bales, silt fence and/or sandbags. Once contained, the drilling fluid is either collected by vacuum trucks or pumped to a location where vacuum trucks can be accessed. The fluids are then transported either back to the HDD Drilling Rig or to a disposal site.

If the release is mitigated and controlled, forward progress of the drilling will be approved by the EI in coordination with the HDD Superintendent and CI.

The site-specific response will follow these guidelines:

4.1 Upland Location

- Evaluate the amount of release to determine if containment structures are warranted and if they will effectively contain the release.

- Promptly implement appropriate containment measures as needed to contain and recover the slurry.
- If the release is within 50-foot of a wetland or waterbody, silt fence and/or hay bales will be installed between the release site and the wetland or waterbody.
- If the release cannot be contained, then the HDD Operator must suspend drilling operations until appropriate containment is in place.
- Remove the fluids using either a vacuum truck or by pumping to a location where a vacuum truck is accessible.
- After the HDD installation is complete, perform final clean-up (see Section 6).

4.2 Wetland Location

- Evaluate the amount of release to determine if containment structures are warranted and if they will effectively contain the release.
- Promptly implement appropriate containment measures to contain and recover the slurry;
    - Efforts to contain and recover slurry in wetlands may result in further disturbance by equipment and personnel, and possibly offset the benefit gained in removing the slurry.
    - If the amount of the slurry is too small to allow the practical collection from the affected area, the fluid will be diluted with fresh water or allowed to dry and dissipate naturally.
- If the release cannot be controlled or contained, immediately suspend drilling operations until appropriate containment is in place.
- Remove the fluids using either a vacuum truck or by pumping to a location where a vacuum truck is accessible.
- After the HDD installation is complete, perform final clean-up (see Section 6).

5.0 NOTIFICATIONS

In the event of an inadvertent drilling fluid return within a waterway, wetland, or sensitive environmental resource area, Algonquin will contact FERC, and or the FERC representative, and the applicable federal and state agencies that regulate returns according to permit reporting requirements, but no later than 24 hours after detection. Once Algonquin selects it's HDD contractor, a more specific notification system will be developed to comply with permit conditions. Details of the inadvertent return will contain, at a minimum:

- The location, nature of the release and estimated volume;
- Take immediate corrective actions that may include, but are not limited to, installation of erosion control devices to contain the release, determination of any permit reporting limits, a temporary shutdown of the drilling operations to determine the cause of the release, and coordination with Algonquin's HDD Superintendent and CI and contractor to determine if there are other drilling techniques that can be used to eliminate the return such as the use of additives or lower drilling pressures.

Once a release has been identified, the appropriate agency notifications will be made. Notification protocols will be determined during the permitting process with state and federal agencies, and these protocols will be provided to the drilling contractor, the Algonquin inspection staff, and will be part of the environmental training to be conducted prior to construction. During the permitting process, it will be determined if agency approval is needed to commence drilling operations after a release. If so, a detailed communication protocol will be established in consultation with the contractor, Algonquin staff, and the agencies. The protocol will include agency contact names, Algonquin contacts, reporting limits, reporting time schedules, reporting tracking, and approval tracking.

6.0 CLEAN-UP

After completion of the HDD installation, site-specific clean-up measures will be developed by the CI, HDD Superintendent, for approval by the EI. Potential for secondary impact from the clean-up process is to be evaluated and benefits of clean-up activities.

The following measures are considered appropriate:

- Drilling mud will be cleaned up by hand using hand shovels, buckets and soft bristled brooms minimizing damage to existing vegetation.
- Fresh water washes may be employed if deemed beneficial and feasible.
- Containment structures will be pumped out and the ground surface scraped to bare topsoil minimizing loss of topsoil or damage to adjacent vegetation.
- The recovered drilling fluid will be recycled or disposed of at an approved upland location or disposal facility. No recovered drilling fluid will be disposed of in streams or storm drains
- All containment structures will be removed.
- Recovered materials will be collected in containers for temporary storage prior to removal from the site.
- Disturbed areas will be stabilized by seeding and mulching as approved by the EI.

Attachment E
Rhode Island State Wetland Edge Delineation Forms

Wetland Edge Delineation Data Form (UPLAND)

Applicant: Enbridge
Wetland No. W1
Project Name: Sakonnet River HDD
Flag No. Sequence: W1-100 - W1-120
City/Town: Portsmouth/Newport
Delineation Date: 01/18/23

Vegetation: List the three dominant species in each vegetative strata along with their NWI status:

Tree	Indicator Status	Herbs	Indicator Status
None		Solidago sp.	
		Scrophularia nodosa	UPL
		Eupatorium perfoliatum	FACW

Saplings/Shrubs	Indicator Status	Woody Vines	Indicator Status
Rubus allegheniensis	FACU	None	
Smilax rotundifolia	FAC		

List other vegetative species noted which may have affected determination of the wetland edge:
Euthamia graminifolia (FAC)

Soil: SCS Soil Survey Mapping Unit: Stissing silt loam (Se)
On Hydric Soils List? ☑ YES ☐ NO
Soil Profile (Note wetland flag no. nearest soil test pit): W1-107

Horizon	Depth	Matrix Color	Mottling Description	Depth to Saturation	Depth to Free Water
	0-12	10YR 3/2 (100%)		n/a	n/a
	12-20+	10YR 3/3 (95%)	7.5YR 4/6 (5%) depletions in the matrix	n/a	n/a

Other indicators exhibiting an absence of wetland hydrology (e.g. absence of water marks, lack of redoximorphic features, lack of oxidized rhizospheres, etc.): The hydrology parameter has not been met.
Landscape position: sploe 0-3%, convex
Altered/atypical situation? (describe):

Comments: No wetland parameters have been met.
According to the U.S drought monitor (https://droughtmonitor.unl.edu/Maps/MapArchive.aspx), normal conditions were present at the time of sampling.

Wetland Edge Delineation Data Form (WETLAND)

Applicant: Enbridge
Wetland No. W1
Project Name: Sakonnet River HDD
Flag No. Sequence: W1-100 - W1-120
City/Town: Portsmouth/Newport
Delineation Date: 01/18/23

Vegetation: List the three dominant species in each vegetative strata along with their NWI status:

Tree	Indicator Status	Herbs	Indicator Status
none		Carex stricta	OBL
		Juncus effusus	OBL
		Eupatorium perfoliatum	FACW

Saplings/Shrubs	Indicator Status	Woody Vines	Indicator Status
Alnus incana	FACW	none	
Rubus allegheniensis	FACU		

List other vegetative species noted which may have affected determination of the wetland edge:
Solidago sp., Onoclea sensibilis (FACW), Scrophularia sp. (FACU)

Soil: SCS Soil Survey Mapping Unit: Stissing silt loam (Se)
On Hydric Soils List? ☐ YES ☐ NO
Soil Profile (Note wetland flag no. nearest soil test pit): W1-107

Horizon	Depth	Matrix Color	Mottling Description	Depth to Saturation	Depth to Free Water
	0-7	2.5Y 4/1 (90%)	7.5YR 4/6 (10%) concentration in the matrix	0 inches	n/a

Other indicators exhibiting an absence of wetland hydrology (e.g. water marks, drainage patterns, root rhizospheres, etc.; see § 3.21.1 (D) of the Rules): The hydrology parameter has been met. Saturation is present, Geomorphic Position and FAC-neutral test
Landscape position: Depression, concave, slope 0-3%
Altered/atypical situation? (describe):

Comments: According to the U.S drought monitor (https://droughtmonitor.unl.edu/Maps/MapArchive.aspx), normal conditions were present at the time of sampling. Did not dig deeper than 7 inches because there was a pipeline close to the surface. All 3 wetland parameters met.

Wetland Edge Delineation Data Form (UPLAND)

Applicant: Enbridge
Project Name: Sakonnet River HDD
City/Town: Portsmouth/Newport
Wetland No. W1
Flag No. Sequence: W2-92 - W2-107
Delineation Date: 01/18/23

Vegetation: List the three dominant species in each vegetative strata along with their NWI status:

Tree	Indicator Status	Herbs	Indicator Status
Acer rubrum	FAC	Polygonum cuspidatum	FACU
		Allium tricoccum	FACU
		Glechoma hederacea	FACU

Saplings/Shrubs	Indicator Status	Woody Vines	Indicator Status
Smilax rotundifolia	FAC	None	
Rosa multiflora	FACU		

List other vegetative species noted which may have affected determination of the wetland edge:
The vegetation parameter has not been met (prevalence > 3.0)

Soil: SCS Soil Survey Mapping Unit: Mansfield mucky silt loam (Ma)
On Hydric Soils List? ☐ YES ☐ NO
Soil Profile (Note wetland flag no. nearest soil test pit): W2-104

Horizon	Depth	Matrix Color	Mottling Description	Depth to Saturation	Depth to Free Water
	0-13	10YR 2/2 (100%)		n/a	n/a
	13- 18+	10YR 4/3 (98%)	10YR 4/4 (2%) concentrations in the matrix	n/a	n/a

Other indicators exhibiting an absence of wetland hydrology (e.g. absence of water marks, lack of redoximorphic features, lack of oxidized rhizospheres, etc.): The hydrology parameter has not been met.
Landscape position: terrace/slope (0-3%), convex
Altered/atypical situation? (describe):

Comments: No wetland parameters have been met.
According to the U.S drought monitor (https://droughtmonitor.unl.edu/Maps/MapArchive.aspx), normal conditions were present at the time of sampling.

Wetland Edge Delineation Data Form (WETLAND)

Applicant: Enbridge
Wetland No. W1
Project Name: Sakonnet River HDD
Flag No. Sequence: W2-92 - W2-107
City/Town: Portsmouth/Newport
Delineation Date: 01/18/23

Vegetation: List the three dominant species in each vegetative strata along with their NWI status:

Tree	Indicator Status	Herbs	Indicator Status
Acer rubrum	FAC	Osmundastrum cinnamomeum	FACW
		Onoclea sensibilis	FACW
		Solidago rugosa	FAC

Saplings/Shrubs	Indicator Status	Woody Vines	Indicator Status
Rosa multiflora	FACU	none	

List other vegetative species noted which may have affected determination of the wetland edge:
Sphagnum sp. (OBL) & Carex sp.

Soil: SCS Soil Survey Mapping Unit: Mansfield mucky silt loam (Ma)
On Hydric Soils List? ☑ YES ☐ NO
Soil Profile (Note wetland flag no. nearest soil test pit): W2-104

Horizon	Depth	Matrix Color	Mottling Description	Depth to Saturation	Depth to Free Water
	0-9	10YR 2/2 (98%)	5YR 4/6 (2%) concentrations in pore linings	0 inches	n/a
	9-15+	2.5Y 4/4 (90%)	2.5Y 4/2 (3%) concentrations in the matrix	0 inches	n/a
			10YR 4/6 (7%) concentrations in the matrix		

Other indicators exhibiting an absence of wetland hydrology (e.g. water marks, drainage patterns, root rhizospheres, etc.; see § 3.21.1 (D) of the Rules): The hydrology parameter has been met. Saturation, water stained leaves, drainage patterns, geomorphic position, FAC neutral test
Landscape position: depression, 0-3 % slope, concave
Altered/atypical situation? (describe):

Comments: Surface water is present within 10 feet of the plot. All 3 wetland parameters met.
According to the U.S drought monitor (https://droughtmonitor.unl.edu/Maps/MapArchive.aspx), normal conditions were present at the time of sampling.

Wetland Edge Delineation Data Form (UPLAND)

Applicant: Enbridge
Project Name: Sakonnet River HDD
City/Town: Portsmouth/Newport
Wetland No. W3
Flag No. Sequence: W3-100 - W3-114
Delineation Date: 01/18/23

Vegetation: List the three dominant species in each vegetative strata along with their NWI status:

Tree	Indicator Status	Herbs	Indicator Status
none		Daucus carota	UPL
		Digitaria sanguinalis	FACU
		Glechoma hederacea	FACU

Saplings/Shrubs	Indicator Status	Woody Vines	Indicator Status
Lonicera morrowii	FACU	Vitis labrusca	FACU
Rosa multiflora	FACU		

List other vegetative species noted which may have affected determination of the wetland edge:
Ranunculus sp, Solidago sp.

Soil: SCS Soil Survey Mapping Unit: Newport silt loam (NeA), 0 to 3 percent slopes
On Hydric Soils List? ☐ YES ☑ NO
Soil Profile (Note wetland flag no. nearest soil test pit): W3-104 & W3-103

Horizon	Depth	Matrix Color	Mottling Description	Depth to Saturation	Depth to Free Water
	0-7 inches	10YR 3/2(100%)		4 inches	n/a
	7-15+ inches	2.5Y 4/3 (97%)	10YR 4/4(3%)Depletion in the matrix	4 inches	n/a

Other indicators exhibiting an absence of wetland hydrology (e.g. absence of water marks, lack of redoximorphic features, lack of oxidized rhizospheres, etc.): Hydrology parameter is met. Saturation possibly due to recent precipitation.
Landscape position: 0-3% slope, open field
Altered/atypical situation? (describe): Soil is significantly disturbed.

Comments: The vegetation parameter has not been met. The soils parameter has not been met. According to the U.S drought monitor (https://droughtmonitor.unl.edu/Maps/MapArchive.aspx), normal conditions were present at the time of sampling.

Wetland Edge Delineation Data Form (WETLAND)

Applicant: Enbridge
Wetland No. W3
Project Name: Sakonnet River HDD
Flag No. Sequence: W3-100 - W3-114
City/Town: Portsmouth/Newport
Delineation Date: 01/18/23

Vegetation: List the three dominant species in each vegetative strata along with their NWI status:

Tree	Indicator Status	Herbs	Indicator Status
Elaeagnus angustifolia	FACU	Urtica dioica	FAC
		Solidago rugosa	FAC
		Juncus effusus	OBL

Saplings/Shrubs	Indicator Status	Woody Vines	Indicator Status
Rosa multiflora	FACU	none	
Lonicera tatarica	FACU		

List other vegetative species noted which may have affected determination of the wetland edge:
Epilobium ciliatum (FACW), Sphagnum sp.

Soil: SCS Soil Survey Mapping Unit: Newport silt loam (NeA), 0 to 3 percent slopes
On Hydric Soils List? ☐ YES ☐ NO
Soil Profile (Note wetland flag no. nearest soil test pit): W3-105

Horizon	Depth	Matrix Color	Mottling Description	Depth to Saturation	Depth to Free Water
	0-12	10YR 3/1 (95%)	10YR 3/4 (5%) concentrations in the pore lining	0 inches	5 inches

Other indicators exhibiting an absence of wetland hydrology (e.g. water marks, drainage patterns, root rhizospheres, etc.; see § 3.21.1 (D) of the Rules): Hydrology indicators include surface water present, high water table present and saturation. There is a secondary hydrology indicator of Geomorphic Position
Landscape position: slope 0-3 %, concave
Altered/atypical situation? (describe): Soil is significantly disturbed. Vegetation is disturbed by routine ROW maintenance mowing.

Comments: The vegetation is problematic due to continupis disturbance of the ROW maintenance mowing. The shrub layer is dominated by Rosa multiflora, a heavilty invasice species known to thrive in seasonally saturated wetland and along wetland margins. In the best professional judgment of the delineator, this area would support a prevalence of hydrophytic vegetation in an undisturbed state.

Wetland Edge Delineation Data Form (UPLAND)

Applicant: Enbridge
Project Name: Sakonnet River HDD
City/Town: Portsmouth/Newport
Wetland No. W4
Flag No. Sequence: W4-100 - W4-112
Delineation Date: 01/18/23

Vegetation: List the three dominant species in each vegetative strata along with their NWI status:

Tree	Indicator Status	Herbs	Indicator Status
none		Oxalis stricta	FACU
		Carex pensylvanica	UPL
		Eutrochium maculatum	OBL

Saplings/Shrubs	Indicator Status	Woody Vines	Indicator Status
Rosa multiflora	FACU	Vitis labrusca	FACU
Mallus sp			

List other vegetative species noted which may have affected determination of the wetland edge:

Soil: SCS Soil Survey Mapping Unit: Stissing silt loam (Se)
On Hydric Soils List? ☐ YES ☐ NO
Soil Profile (Note wetland flag no. nearest soil test pit): W4-108 & W4-109

Horizon	Depth	Matrix Color	Mottling Description	Depth to Saturation	Depth to Free Water
	0-8	10YR 3/2 (98%)	10YR 3/4 (2%) *concentrations in the matrix	n/a	n/a
	8-20	2.5Y 4/3 (98%)	10YR 4/4 (2%) *concentrations in the matrix	n/a	n/a

Other indicators exhibiting an absence of wetland hydrology (e.g. absence of water marks, lack of redoximorphic features, lack of oxidized rhizospheres, etc.): The hydrology parameter has not been met.
Landscape position: 0-3 % slope, convex
Altered/atypical situation? (describe): Vegetation significantly disturbed, lawn area is mowed.

Comments: According to the U.S drought monitor (https://droughtmonitor.unl.edu/Maps/MapArchive.aspx), normal conditions were present at the time of sampling.

Wetland Edge Delineation Data Form (WETLAND)

Applicant: Enbridge
Wetland No. W4
Project Name: Sakonnet River HDD
Flag No. Sequence: W4-100 - W4-112
City/Town: Portsmouth/Newport
Delineation Date: 01/18/23

Vegetation: List the three dominant species in each vegetative strata along with their NWI status:

Tree	Indicator Status	Herbs	Indicator Status
none		Eupatorium maculatum	OBL
		Onoclea sensibilis	FACW
		Juncus effusus	OBL

Saplings/Shrubs	Indicator Status	Woody Vines	Indicator Status
Rosa multiflora	FACU	Vitus labrusca	FACU
Salix cinerea (susp)	FACW		

List other vegetative species noted which may have affected determination of the wetland edge:
Carex stricta (OBL)

Soil: SCS Soil Survey Mapping Unit: Stissing silt loam (Se)
On Hydric Soils List? ☑ YES ☐ NO
Soil Profile (Note wetland flag no. nearest soil test pit): W4-108 & W4-109

Horizon	Depth	Matrix Color	Mottling Description	Depth to Saturation	Depth to Free Water
	0-2	10YR 3/2 (100%)		0 inches	n/a
	2-12	2.5Y 5/3 (55%)	10YR 5/8 (5%)	0 inches	n/a
			2.5Y 5/2 (40%)		

Other indicators exhibiting an absence of wetland hydrology (e.g. water marks, drainage patterns, root rhizospheres, etc.; see § 3.21.1 (D) of the Rules): The wetland hydrology parameter has been met. Loamy mucky mineral.
Landscape position: Depression, concave, 0-3% slope
Altered/atypical situation? (describe):

Comments: According to the U.S drought monitor (https://droughtmonitor.unl.edu/Maps/MapArchive.aspx), normal conditions were present at the time of sampling.
All 3 wetland parameters met.

Attachment F
Photography Log

Photograph 1. Boundary of W1.

Photograph 2. Wetland W1. This area will be avoided by the HDD. Surface water

Photograph 3. Wetland W1. This area will be avoided by the HDD.

Photograph 4. Wetland W1. This area will be avoided by the HDD.

Photograph 5. S1. This stream will be avoided by the HDD.

Photograph 6. S2. Part of this stream falls within ATWS, but no disturbance of bed or banks is proposed.

Photograph 7. W3.

Photograph 8. W4 adjacent to M&R Station 0013.

Photograph 9. Sakonnet River western bank. Facing north. No workspace or disturbance in this area.

Photograph 10. Sakonnet River western Bank. Facing south. No workspace or disturbance in this area.

Attachment G Agency Correspondences

STATE OF RHODE ISLAND

HISTORICAL PRESERVATION & HERITAGE COMMISSION

Old State House 150 Benefit Street Providence, RI 02903

Telephone 401-222-2678 Fax 401-222-2968
www.preservation.ri.gov

TTY 401-222-3700

18 August, 2023

Gregory Dubell
Energy Projects Manager
PAL Inc
Via email

Re: Phase I Archaeological Survey
Algonquin Gas G-2 System Pipeline Maintenance Project
Little Compton and Portsmouth, RI
PAL #4303.07

Dear Mr. Dubell,

The RIHPHC has reviewed the report of the above-referenced survey. We concur with PAL's conclusion that none of the five archaeological resources are eligible for listing on the National Register of Historic Places. No additional archaeological survey is required.

We have assigned the following site numbers:

2875 Almy Farm Site
2876 G-2 East Site 1
2877 G-2 East Site 2
2878 G-2 Find Spot
2879 Old Mill Lane Find Spot.

We further concur with PAL's conclusion that the project will not affect any historic properties, and no additional historic architectural survey is warranted.

These comments are provided in accordance with Section 106 of the National Historic Preservation Act. If you have any questions, please contact Charlotte Taylor, archaeologist at this office.

Very truly yours,

Charlotte Taylor (for)

Jeffrey D. Emidy
Executive Director
Acting State Historic Preservation Officer

Cc: John Brown, NITHPO

230818.05

Public Archaeology Laboratory

July 21, 2023

Jeffrey Emidy
Executive Director and State Historic Preservation Officer
Rhode Island Historical Preservation & Heritage Commission
150 Benefit Street
Providence, Rhode Island 02903

Re: Algonquin Gas Transmission, LLC
G-2 System Pipeline Maintenance Project, Little Compton and Portsmouth, Rhode Island
PAL #4303.07

Dear Mr. Emidy:

As you are aware, Algonquin Gas Transmission, LLC (Algonquin) owns and operates a natural gas pipeline system in Rhode Island and is currently proposing the G-2 System Natural Gas Pipeline Maintenance Project, which involves the replacement of a section of pipeline by installing a new, approximately 7,300-foot-long section of 12-inch pipeline beneath the Sakonnet River via horizontal directional drill. The Project also includes replacing the remaining 2,600-foot-long section of the existing 6-inch G-2 System pipeline west of the Sakonnet River to Algonquin's existing metering and regulating (M&R) station 00013 with a new 12-inch pipeline, thus improving the overall G-2 System integrity and reliability to the surrounding area. Please see enclosed for a complete map set depicting the proposed conditions of the Project facilities.

On April 13, 2022, The Public Archaeology Laboratory, Inc. (PAL) notified the Rhode Island Historical Preservation Heritage Commission, office of the State Historic Preservation Officer (SHPO) of the Project, submitting a permit application to perform a Phase I archaeological survey; on April 27, 2022, the Rhode Island SHPO issued Permit #22-05 to PAL to perform the survey. On February 21, 2023, PAL requested that the Rhode Island SHPO amend the permit to include the section of the G-2 System west of the Sakonnet River to M&R 00013, and on March 10, 2023, SHPO amended the permit. On behalf of Algonquin, please find enclosed the following technical report on the investigations PAL performed for the proposed Project:

> *Phase I Archaeological Survey, Algonquin Gas Transmission, LLC, G-2 System Natural Gas Pipeline Maintenance Project, Little Compton and Portsmouth, Rhode Island – July 2023*

Pursuant to the Natural Gas Act (NGA) blanket certificate program (18 CFR 157.206[b][3][ii] and Appendix II of Subpart F), Algonquin will file a Prior Notice Application with the Federal Energy Regulatory Commission (FERC) presenting the results of the proposed pipeline maintenance work; Algonquin will also file wetland and waterbody permit applications with the U.S. Army Corps of Engineers under the Rhode Island General Permit. The FERC will serve as the lead federal agency for this undertaking and the Project is subject to review pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations at 36 CFR 800. PAL has been contracted by Algonquin to address the Section 106 obligations of the FERC and seek the comments of the Rhode Island SHPO.

PAL conducted the Phase I archaeological survey for the proposed Project, identifying 26 pieces of cultural material (9 pre-contact and 17 post-contact) during subsurface testing with 106, 50-x-50-centimeter test pits within the Project study areas. Five archaeological resources were identified: four pre-contact sites and

find spots (the G-2 East 1 Site, G-2 East 2 Site, G-2 Find Spot, and Old Mill Lane Find Spot) and one post-contact site (the Almy Farm Site). No archaeological features were identified and all five identified sites and find spots are low-density artifact scatters that have been disturbed or redistributed by repeated plowing or twentieth-century land development. Each of the sites exhibit moderate to poor archaeological integrity and have limited potential to provide new information or research value, and no further archaeological investigations are recommended.

PAL also performed a desktop review of historic architectural properties within and adjacent to the Project corridor and determined the Project does not abut any properties that are recorded in Rhode Island SHPO's inventory or listed in the National Register of Historic Places (National Register). Review of historic aerials, USGS quadrangle maps, Rhode Island GIS, historic maps, and assessor data indicates that there are no properties immediately adjacent to the Project ROW that are over 50 years of age, and they all post-date the installation of the pipeline. PAL identified one historic architectural property that is adjacent to proposed workspace at 175 West Main Road in Little Compton (a 1930s-era bungalow style residence), however that property is evaluated by PAL as not meeting the Criteria of Eligibility for listing in the National Register. Finally, the closes property that has been evaluated as eligible for listing in the National Register is the Rod Feather Farm/Almy Farm, located approximately 0.2 miles southeast of the Project ROW and is separated by woods and modern infill development. Based on this desktop assessment, PAL recommends that a full historic architectural reconnaissance survey is not warranted, and an effects assessment is not needed.

Therefore, based on the results of the Phase I archaeological survey and a desktop assessment of historic architectural resources, PAL recommends that the Project, as currently proposed, will not affect any historic properties (36 CFR 800.4[d][1]); no further cultural resource investigations are warranted. With this letter, we are requesting the Rhode Island SHPO's concurrence with this recommendation.

If you have any questions or require additional information, please do not hesitate to contact Joseph N. Waller, Jr., Principal Investigator, or me, at your convenience. We thank you for your attention to this matter.

Sincerely,

Gregory R. Dubell, RPA
Energy Projects Manager

Enclosures

cc: Maxwell Bergeron, Algonquin (w/encl. – via email)
Christopher Lombardi, Algonquin (w/encl. – via email)
Katelyn Wheeler, SWCA (w/encl. – via email)
John Brown, III, Narragansett Indian Tribe (w/encl. – via email)
Cora Peirce, Narragansett Indian Tribe (w/encl. – via email)
David Weeden, Mashpee Wampanoag Tribe (w/encl – via email)
Bettina Washington, Wampanoag Tribe of Gay Head (Aquinnah) (w/encl. – via email)
Mark Andrews, Wampanoag Tribe of Gay Head (Aquinnah) (w/encl. – via email)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104

In Reply Refer To:
Project Code: 2023-0087341
Project Name: Sakonnet River HDD

May 30, 2023

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Updated 4/12/2023 - Please review this letter each time you request an Official Species List, we will continue to update it with additional information and links to websites may change.

About Official Species Lists

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Federal and non-Federal project proponents have responsibilities under the Act to consider effects on listed species.

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested by returning to an existing project's page in IPaC.

Endangered Species Act Project Review

Please visit the "**New England Field Office Endangered Species Project Review and Consultation**" website for step-by-step instructions on how to consider effects on listed

species and prepare and submit a project review package if necessary:

https://www.fws.gov/office/new-england-ecological-services/endangered-species-project-review

NOTE Please do not use the **Consultation Package Builder** tool in IPaC except in specific situations following coordination with our office. Please follow the project review guidance on our website instead and reference your **Project Code** in all correspondence.

Northern Long-eared Bat - (**Updated 4/12/2023**) The Service published a final rule to reclassify the northern long-eared bat (NLEB) as endangered on November 30, 2022. The final rule went into effect on March 31, 2023. You may utilize the **Northern Long-eared Bat Rangewide Determination Key** available in IPaC. More information about this Determination Key and the Interim Consultation Framework are available on the northern long-eared bat species page:

https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis

For projects that previously utilized the 4(d) Determination Key, the change in the species' status may trigger the need to re-initiate consultation for any actions that are not completed and for which the Federal action agency retains discretion once the new listing determination becomes effective. If your project was not completed by March 31, 2023, and may result in incidental take of NLEB, please reach out to our office at newengland@fws.gov to see if reinitiation is necessary.

Additional Info About Section 7 of the Act
Under section 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether projects may affect threatened and endangered species and/or designated critical habitat. If a Federal agency, or its non-Federal representative, determines that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Federal agency also may need to consider proposed species and proposed critical habitat in the consultation. 50 CFR 402.14(c)(1) specifies the information required for consultation under the Act regardless of the format of the evaluation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/service/section-7-consultations

In addition to consultation requirements under Section 7(a)(2) of the ESA, please note that under sections 7(a)(1) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Please contact NEFO if you would like more information.

Candidate species that appear on the enclosed species list have no current protections under the ESA. The species' occurrence on an official species list does not convey a requirement to

consider impacts to this species as you would a proposed, threatened, or endangered species. The ESA does not provide for interagency consultations on candidate species under section 7, however, the Service recommends that all project proponents incorporate measures into projects to benefit candidate species and their habitats wherever possible.

Migratory Birds

In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see:

https://www.fws.gov/program/migratory-bird-permit

https://www.fws.gov/library/collections/bald-and-golden-eagle-management

Please feel free to contact us at **newengland@fws.gov** with your **Project Code** in the subject line if you need more information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat.

Attachment(s): Official Species List

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

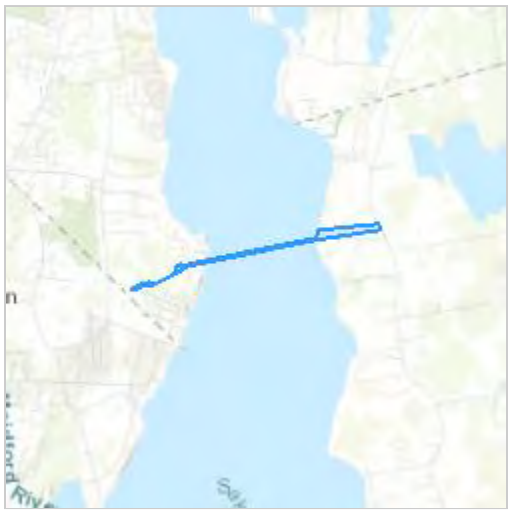
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

PROJECT SUMMARY

Project Code: 2023-0087341
Project Name: Sakonnet River HDD
Project Type: Pipeline - Onshore - Maintenance / Modification - Below Ground
Project Description: Replacement of G-2 pipeline beneath the Sakonnet river to the Newport metering station.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@41.5274452,-71.2201463273004,14z



Counties: Newport County, Rhode Island

ENDANGERED SPECIES ACT SPECIES

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered

BIRDS

NAME	STATUS
Roseate Tern *Sterna dougallii dougallii* Population: Northeast U.S. nesting population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2083	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: SWCA
Name: Sam Hayden
Address: 8 Science Park Road
City: Scarborough
State: ME
Zip: 04074
Email samuel.hayden@swca.com
Phone: 4434741880

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104

In Reply Refer To:
Project code: 2023-0087341
Project Name: Sakonnet River HDD

May 30, 2023

Federal Action Agency (if applicable): Federal Energy Regulatory Commission

Subject: Record of project representative's no effect determination for 'Sakonnet River HDD'

Dear Sam Hayden:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on May 30, 2023, for 'Sakonnet River HDD' (here forward, Project). This project has been assigned Project Code 2023-0087341 and all future correspondence should clearly reference this number. **Please carefully review this letter.**

Ensuring Accurate Determinations When Using IPaC

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into the IPaC must accurately represent the full scope and details of the Project. Failure to accurately represent or implement the Project as detailed in IPaC or the Northern Long-eared Bat Rangewide Determination Key (Dkey), invalidates this letter.

Determination for the Northern Long-Eared Bat

Based upon your IPaC submission and a standing analysis, your project has reached the determination of "No Effect" on the northern long-eared bat. To make a no effect determination, the full scope of the proposed project implementation (action) should not have any effects (either positive or negative), to a federally listed species or designated critical habitat. Effects of the action are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may

include consequences occurring outside the immediate area involved in the action. (See § 402.17).

Under Section 7 of the ESA, if a federal action agency makes a no effect determination, no consultation with the Service is required (ESA §7). If a proposed Federal action may affect a listed species or designated critical habitat, formal consultation is required except when the Service concurs, in writing, that a proposed action "is not likely to adversely affect" listed species or designated critical habitat [50 CFR §402.02, 50 CFR§402.13].

Other Species and Critical Habitat that May be Present in the Action Area

The IPaC-assisted determination for the northern long-eared bat does not apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

- Monarch Butterfly *Danaus plexippus* Candidate
- Roseate Tern *Sterna dougallii dougallii* Endangered

You may coordinate with our Office to determine whether the Action may affect the animal species listed above and, if so, how they may be affected.

Next Steps

Based upon your IPaC submission, your project has reached the determination of “No Effect” on the northern long-eared bat. If there are no updates on listed species, no further consultation/ coordination for this project is required with respect to the northern long-eared bat. However, the Service recommends that project proponents re-evaluate the Project in IPaC if: 1) the scope, timing, duration, or location of the Project changes (includes any project changes or amendments); 2) new information reveals the Project may impact (positively or negatively) federally listed species or designated critical habitat; or 3) a new species is listed, or critical habitat designated. If any of the above conditions occurs, additional coordination with the Service should take place to ensure compliance with the Act.

If you have any questions regarding this letter or need further assistance, please contact the New England Ecological Services Field Office and reference Project Code 2023-0087341 associated with this Project.

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

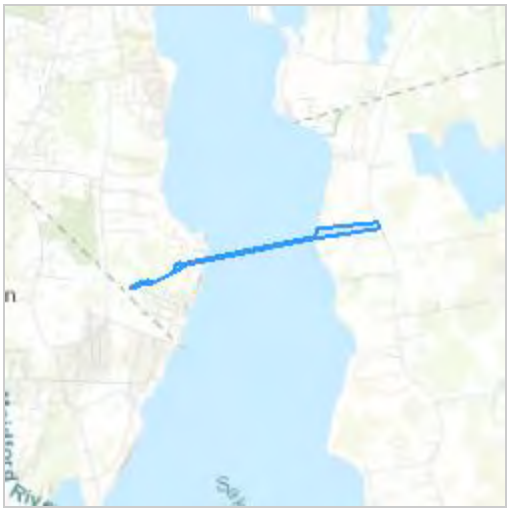
Sakonnet River HDD

2. Description

The following description was provided for the project 'Sakonnet River HDD':

> Replacement of G-2 pipeline beneath the Sakonnet river to the Newport metering station.

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@41.5274452,-71.2201463273004,14z



DETERMINATION KEY RESULT

Based on the information you provided, you have determined that the Proposed Action will have no effect on the Endangered northern long-eared bat (Myotis septentrionalis). Therefore, no consultation with the U.S. Fish and Wildlife Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (87 Stat. 884, as amended 16 U.S.C. 1531 *et seq.*) is required for those species.

QUALIFICATION INTERVIEW

1. Does the proposed project include, or is it reasonably certain to cause, intentional take of the northern long-eared bat or any other listed species?

   Note: Intentional take is defined as take that is the intended result of a project. Intentional take could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species?

   No

2. The proposed action does not intersect an area where the northern long-eared bat is likely to occur, based on the information available to U.S. Fish and Wildlife Service as of the most recent update of this key. If you have data that indicates that northern long-eared bats are likely to be present in the action area, answer "NO" and continue through the key.

   Do you want to make a no effect determination?

   Yes

PROJECT QUESTIONNAIRE

IPAC USER CONTACT INFORMATION

Agency: SWCA
Name: Sam Hayden
Address: 8 Science Park Road
City: Scarborough
State: ME
Zip: 04074
Email samuel.hayden@swca.com
Phone: 4434741880

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Federal Energy Regulatory Commission

Endangered Species Act (ESA) Section 7 Determination Table

Project Name: Sakonnet River HDD

Date: 5/31/2023

Project Code: 2023-0087341

Species / Resource Name *Insert name of species or resource as listed on Official Species List.*	Habitat/Species Presence in Action Area *Indicate if suitable habitat and species are present in the Action Area (see examples in Step 5).*	Sources of Info *Explain what info suitable habitat/species presence is based on.*	ESA Section 7 Determination *Using reasoning and decision tables in Step 5, select determination for each species (e.g. no effect, not likely to adversely affect, or likely to adversely affect).*	Project Elements that Support Determination *Explain which project elements may impact the habitat or individuals of each species and any Avoidance and Minimization Measures being implemented.*
Northern Long Eared Bat (NLEB) (*Myotis septentrionalis*)	*Yes suitable habitat, unknown species present*	*IPaC tool,* Species Profile for Northern Long-Eared Bat(Myotis septentrionalis) (fws.gov)	*No effect*	*USFWS Northern Long-eared Bat Rangewide Determination Key identified Project area does not intersect an area where NLEB is likely to occur.*
Reseate Tern (*Sterna dougallii*)	*Yes suitable habitat, unknown species present*	IPaC tool, Roseate Tern (Sterna dougallii dougallii) | U.S. Fish & Wildlife Service (fws.gov)	No effect	No impacts to potential breeding habitat due to utilization of HDD. Banks and areas adjacent to Sakonnet River will not be impacted.

NOAA Section 7 Endangered Species Act (ESA) Species Determination Table

Project Name: Sakonnet River HDD

Date: 5/31/2023

Consultation Code: N/A

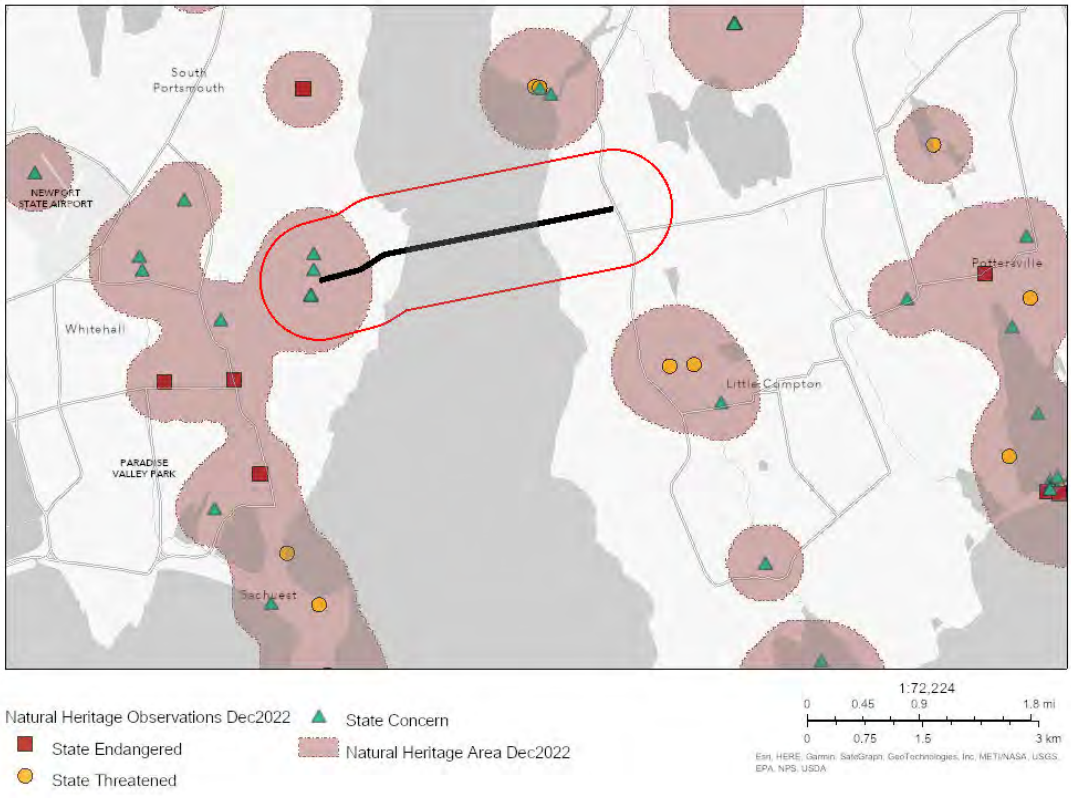
Species / Resource Name *Insert name of species or resource as listed on Official Species List.*	Habitat/Species Presence in Action Area *Indicate if suitable habitat and species are present in the Action Area (see examples in Step 5).*	Sources of Info *Explain what info suitable habitat/species presence is based on.*	ESA Section 7 Determination *Using reasoning and decision tables in Step 5, select determination for each species (e.g. no effect, not likely to adversely affect, or likely to adversely affect).*	Project Elements that Support Determination *Explain which project elements may impact the habitat or individuals of each species and any Avoidance and Minimization Measures being implemented.*
Atlantic Sturgeon *Acipenser oxyrinchus*	*No*	*NOAA Website* Atlantic Sturgeon | NOAA Fisheries	*No Effect*	*No in water work or disturbance of bed or banks of Sakonnet River.*
Shortnose Sturgeon *Acipenser brevirostrum*	No	NOAA Website Shortnose Sturgeon | NOAA Fisheries	*No Effect*	*No in water work or disturbance of bed or banks of Sakonnet River.*
Right Whale *Eubalaena australis*	*No*	NOAA Website North Atlantic Right Whale | NOAA Fisheries	*No Effect*	*No in water work or disturbance of bed or banks of Sakonnet River.*
Fin whale *Balaenoptera physalus*	*No*	NOAA Website Fin Whale | NOAA Fisheries	*No Effect*	*No in water work or disturbance of bed or banks of Sakonnet River.*
Green sea turtle *Balaenoptera physalus*	*No*	NOAA Website Green Turtle | NOAA Fisheries	*No Effect*	*No in water work or disturbance of bed or banks of Sakonnet River.*
Kemp's ridley sea turtle *Lepidochelys kempii*	*No*	NOAA Website Kemp's Ridley Turtle | NOAA Fisheries	*No Effect*	*No in water work or disturbance of bed or banks of Sakonnet River.*
Leatherback sea turtle *Dermochelys coriacea*	*No*	NOAA Website Leatherback Turtle | NOAA Fisheries	*No Effect*	*No in water work or disturbance of bed or banks of Sakonnet River.*
Loggerhead sea turtle *Caretta caretta*	*No*	NOAA Website Loggerhead Turtle | NOAA Fisheries	*No Effect*	*No in water work or disturbance of bed or banks of Sakonnet River.*

Natural Heritage Screening Sakonnet River Pipeline

Area of Interest (AOI) Information

Area : 84,287,752.79 ft²

Jun 19 2023 7:27:05 Eastern Daylight Time



Summary

Name	Count	Area(ft²)	Length(ft)
Natural Heritage Observations Dec2022	5	N/A	N/A

Natural Heritage Observations Dec2022

#	Family	Genus	Species	COMNAME	SurvDate	LAST_OBS	RI_ STAT	Count
1	Amphibian	Lithobates	pipiens	Northern Leopard Frog	00/00/2010	2010	State Concern	2
2	Amphibian	Lithobates	pipiens	Northern Leopard Frog	06/17/1985	1985	State Concern	1
3	Bird	Cistothorus	palustris	Marsh Wren	05/20/1984	1984	State Concern	1
4	Bird	Porzana	carolina	Sora	05/20/1984	1984	State Concern	1

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June 16, 2023

Paul Jordan
Data Analyst/Supervising GIS Specialist
Rhode Island Department of Environmental Management
235 Promenade Stret
Providence, RI 02908

Sent electronically to Paul.Jordan@dem.ri.gov

Re: State Threatened and Endangered Species Data Request
Algonquin Gas Transmission, LLC
G-2 Natural Gas Pipeline Maintenance Project
Portsmouth and Little Compton, Rhode Island

Mr. Jordan:

On behalf of Algonquin Gas Transmission, LLC (Algonquin), SWCA Environmental Consultants (SWCA) is requesting additional information from the Rhode Island Natural Heritage Program regarding state protected species that may exist within the proposed footprint for Algonquin's G-2 Natural Gas Pipeline Maintenance Project (Project) located in the City of Portsmouth and Town of Little Compton.

Algonquin is an interstate natural gas pipeline transmission company that maintains and operates interstate pipelines extending from New Jersey through the states of New Jersey, New York, Connecticut, Rhode Island, and Massachusetts. The company's interstate pipeline network includes an existing six-inch diameter pipeline that is partially located in Portsmouth and Little Compton, Rhode Island that interconnects with Rhode Island Energy, the local gas distribution company. The existing pipeline is the sole source of natural gas for homes and businesses on Aquidneck Island. This pipeline was originally installed in 1954.

The Project is being undertaken based on Algonquin's responsibility for maintaining the structural integrity and ensuring the safety and reliability of its natural gas pipeline systems; accordingly, Algonquin routinely monitors, inspects, and maintains its pipelines. The Project involves replacement of approximately 1.95 miles of Algonquin's existing 6-inch G-2 natural gas pipeline with 12-inch using horizontal directional drilling (HDD) and open cut methods. The project limits extend from the east side of the Sakonnet River, in Little Compton to an existing Meter and Regulation Station 00013 (M&R 00013) in Portsmouth.

The following information is provided as part of this data request to identify any protected natural resources that may occur within the Project. Included are details on existing site characteristics, proposed construction activities, best management practices and site restoration.

Project Scope

The Project work will be located within a section of the pipeline's crossing beneath the tidally influenced Sakonnet River between Little Compton and Portsmouth, RI. To repair this segment of pipeline, Algonquin is proposing to install a new, approximately 7,300-foot long section of 12-inch diameter pipeline beneath the

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Scarborough, Maine 04074
www.swca.com

Sakonnet River via an HDD. The HDD will be routed within close proximity to the existing pipeline ROW. By using the HDD method, there are no anticipated impacts to the Sakonnet River as the new segment will be drilled a considerable depth beneath the riverbed within competent bedrock with no need for excavation in the river. The existing G-2 pipeline will be grouted and abandoned in place.

The Project also includes replacing the remaining 2,600 foot section of the existing 6-inch G-2 pipeline west of the Sakonnet River to Algonquin's existing M&R 00013 with a new 12-inch pipeline, thus improving the overall G-2 system integrity and reliability to the surrounding area. This section of existing 6-inch G-2 pipeline will also be grouted and abandoned in place. This segment will be replaced using a combination of HDD and open-cut method. The HDD will be utilized to install approx. 1,300 feet of pipeline under Cotton Swamp to avoid and minimize impacts. Aboveground and below ground modifications will be required at M&R 00013 to tie-in the new pipeline with the existing facility. There will be tree clearing required for workspace on both the east and west side of the Sakonnet River. Work associated with the Project is scheduled to begin during spring of 2024, once all necessary federal and state permits are acquired.

We are requesting additional information regarding protected natural resources habitat or species potentially present in this area to assist the Project team in avoidance and minimization efforts. If you have any questions, please reach out to me by email at Katelyn.Wheeler@swca.com or phone at 207-509-4386.

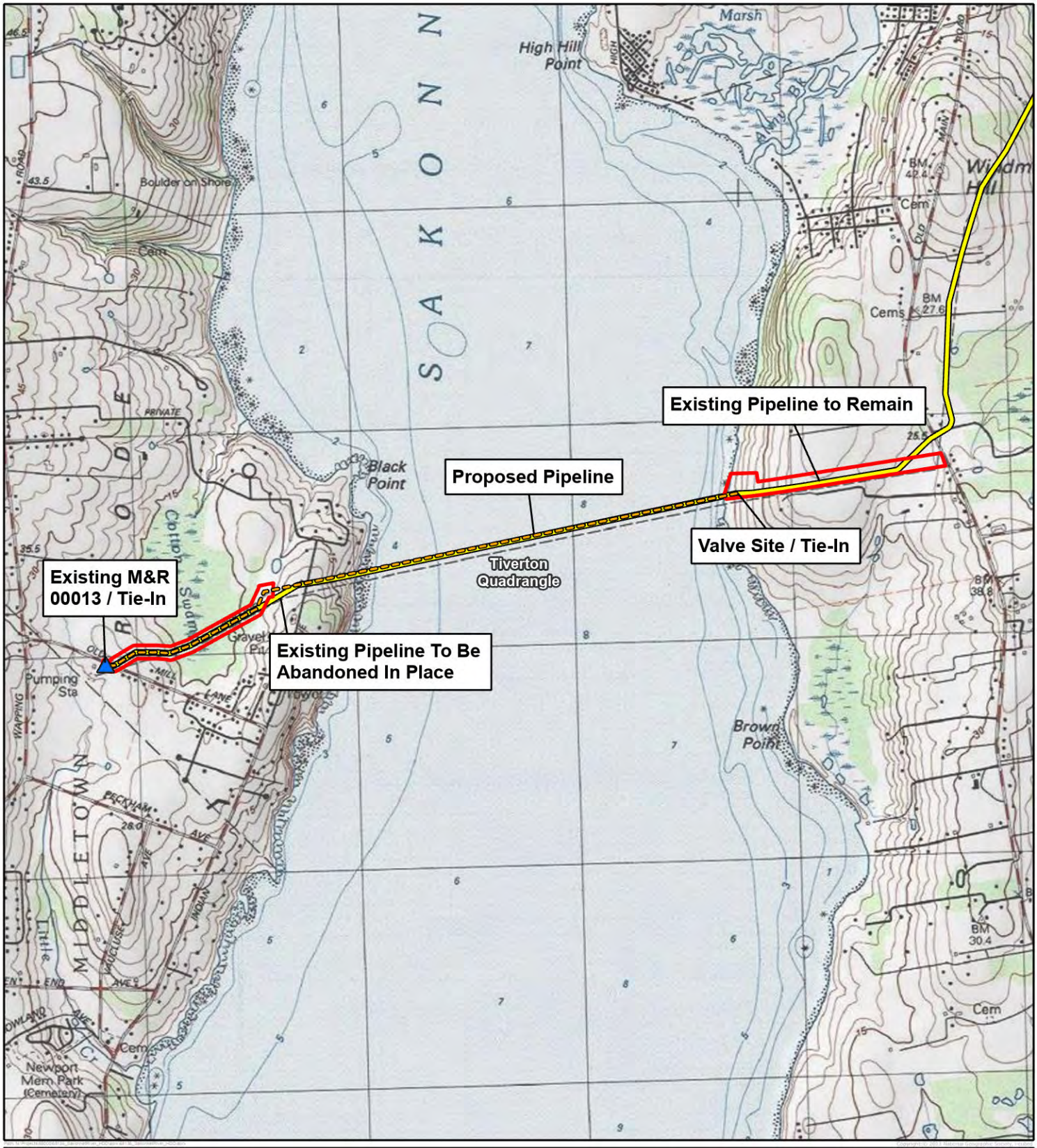
Sincerely,

Katelyn Wheeler

Associate Project Manager

APPENDIX A

Mapping



ENBRIDGE
ALGONQUIN GAS TRANSMISSION, LLC

G-2 NATURAL GAS PIPELINE MAINTENANCE PROJECT

USGS TOPOGRAPHIC MAP

TIVERTON QUADRANGLE
PORTSMOUTH AND LITTLE COMPTON, RI

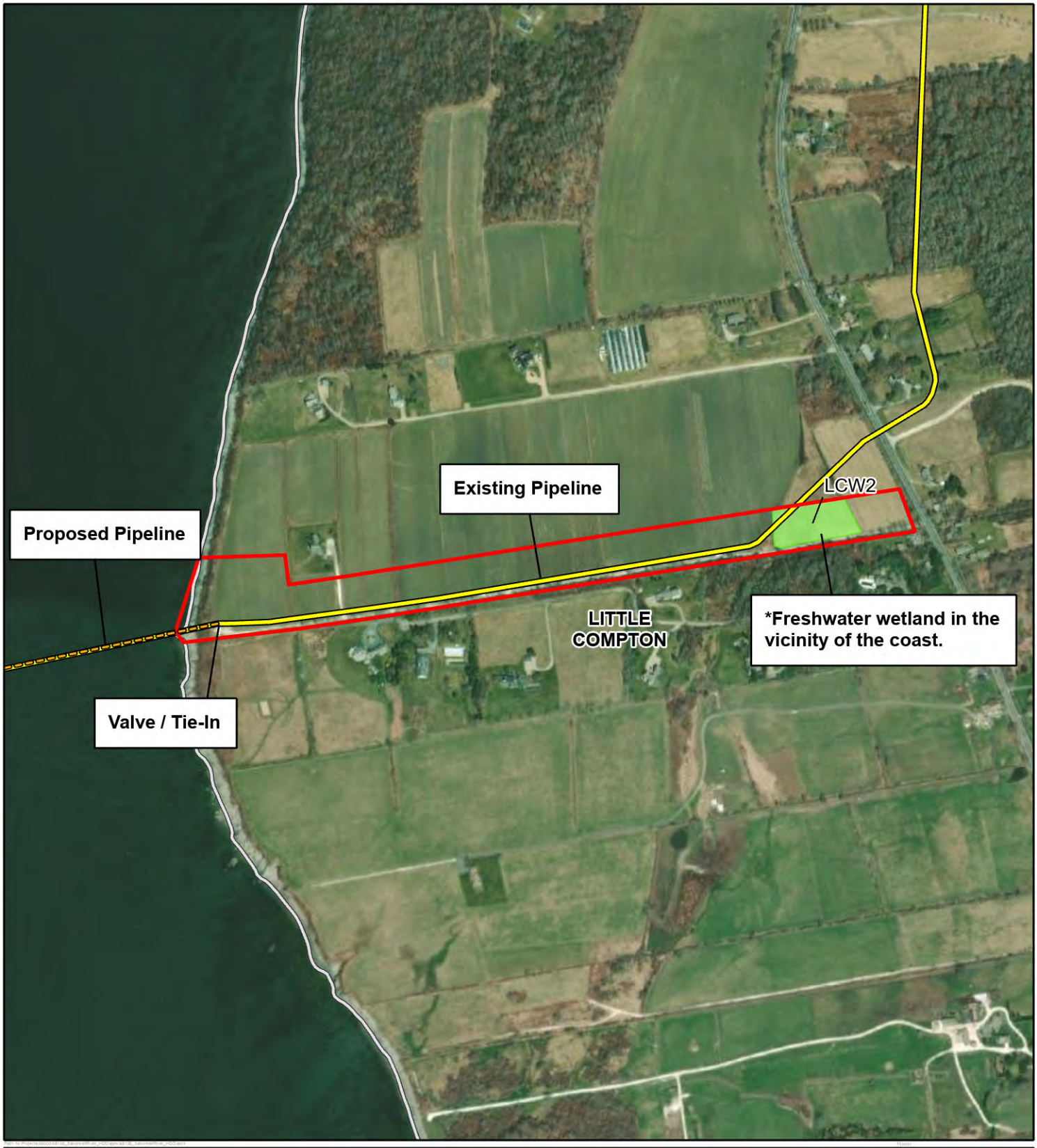
- Meter and Regulation Station 00013
- Existing Pipeline
- Proposed Pipeline
- Project Area

SWCA
ENVIRONMENTAL CONSULTANTS

1:24,000

Created By: S. McKinney
Project Number: 68136
Date: 5/15/2023
NAD 1983 2011 StatePlane Rhode Island FIPS 3800 Ft US

0 1,000 2,000 Feet
0 250 500 Meters



ENBRIDGE
ALGONQUIN GAS TRANSMISSION, LLC

G-2 NATURAL GAS PIPELINE MAINTENANCE PROJECT

NATURAL RESOURCE DELINEATION MAP EAST BANK

TIVERTON QUADRANGLE
LITTLE COMPTON, RI

- Existing Pipeline
- Proposed Pipeline
- Delineated Wetland Area
- Project Area
- Municipal Boundary

SWCA
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1:7,200

Created By: S. McKinney
Project Number: 68136
Date: 5/15/2023
NAD 1983 2011 StatePlane Rhode Island FIPS 3800 Ft US

0 250 500 Feet
0 50 100 Meters